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EDUCATIONAL PSYCHOLOGY

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STERLING PUBLISHERS PRIVATE LIMITED
NEW DELHI-110016 BANGALORE-560001 JALANDHAR-144003

STERLING PUBLISHERS PRIVATE LIMITED

L-10, Green Park Extension, New Delhi-110016

24, Race Course Road, Madhavanagar, Bangalore-560001

695, Model Town, Jalandhar-144003

Educational Psychology

First Edition 1971

Reprint 1973

Second Edition 1976

Reprint 1978

Third Revised and Enlarged Edition 1980

Fourth Revised and Enlarged Edition 1985

© 1985, C.L. Kundu and D.N. Tutoo

S.C.E.R.T., West Bengal

Date 17-3-87

Acc. No. 3931

370.15
KUN

Printed in India

Published by Sterling Publishers (P) Ltd., L-10, Green Park Extension,
New Delhi-110016.

Printed at Sterling Printers, L-11, Green Park Extension, New Delhi-110016.

PREFACE TO THE FOURTH EDITION

In this revised edition we have aimed at comprehensiveness and while seeking to avoid guise, we have tried to introduce students and general readers to potential aspect of psychology which has an important bearing on education. A chapter on programmed learning and educational technology has been added. References are given throughout. Cognizance has been taken by the authors of many helpful suggestions received from teachers who used earlier editions and reprints of this book and also of many recent developments in the field of educational psychology. An acknowledgement of indebtedness is made to all scholars whose names and works appear in chapter references and to all publishers whose materials have been quoted in this book and to British and American psychologists.

We also wish to thank Dr S.K. Gupta, Dr D.S. Yadav, Dr Miss Sushil Jindal and Dr S.K. Panda, Department of Education, Kurukshetra University, for assistance while the manuscript and index were in preparation.

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PREFACE TO THE FIRST EDITION

Recent advances in the methodology of teaching in class-rooms have made the place of psychology increasingly important in the realms of educational process and teaching practices. Teaching being essentially an important process of communication, the teacher and the taught need to know each other well. Without mutual understanding the bipolar process of teaching cannot be effective and humanistic. It is, therefore, essential that a teacher should know thoroughly his pupils, their development, needs and motives and their basic physical equipment. Without this background, a teacher cannot modify the cognitive, conative and affective behaviour patterns of his pupils. He cannot effectively promote learning and develop their personalities positively. In short, a teacher has to have an understanding of his pupils, their abilities, their limitations, motivations and aspirations in order to make teaching effective and interesting in the class-room. *Educational Psychology* can prove an effective guide to him for understanding the teaching process.

The present book on educational psychology has endeavoured to present various topics which are of professional interest to students studying in B.T., B.Ed., M.A. (Psychology) and M.A. (Education) classes. It has tried to present various problems, involved in the fields of education and psychology and in class-room teaching, in a broad manner. The authors have tried to present the latest developments and viewpoints in respective areas of educational psychology in an objective manner and have given adequate references and bibliography for further reading. It is hoped that the book would be received well by students, who are professionally preparing for B.Ed. or M.Ed. degrees and also by those who are aiming to major in education and psychology by studying these subjects at the postgraduate level.

C.L. KUNDU
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EDUCATIONAL PSYCHOLOGY—NATURE, SCOPE AND IMPORTANCE

EDUCATIONAL psychology attempts to define, describe and explain the changes that take place in individuals in their various stages of development. It deals with the conditions that promote or retard human development. As a result of its study, it describes and often formulates certain principles which are worthy of consideration in directing and fostering the programmes of school education on humanistic lines. Educational psychology is thus a study of the human mind as it bears upon learning and teaching activities. It is an application of the principles of general psychology to the problems of education. Child is born with a number of hereditary equipment. Educational psychology enquires whether man's nature is modified by the environmental forces operating on the processes of learning. It also studies the child's inborn emotions like love, anger and fear, as they bear upon learning and teaching.

Educational psychology is an area of application rather than a unique category of subject-matter. It is the course within the field of education in which the subject-matter, researches and procedures of psychology are brought to bear upon the problems of the classroom. Educational psychology is functional in its character and is not therefore concerned with the contents of the subject. The contents of the subject are determined by the philosophy of education. Educational psychology has to do with the methods of teaching and furnish an experimentally determined basis for them.

Educational psychology is concerned with two cardinal problems, namely, the construction of good teaching procedures and the measurement and evaluation of effects of teaching in an objective manner. It explores and explains the psychology of pupil, his patterns of responses, his hereditary nature and the impact of their forces in his learning and development. Educational psychology draws heavily from the relevant contributions from other forces

such as educational biology, educational sociology, social psychology, developmental psychology, clinical and abnormal psychology, animal psychology, anthropology and physiology.

Educational psychology investigates the methods of imparting education to the child, discovers a number of general rules and applies these to the practical problems of learning arithmetic, algebra, geometry, science and literature. Educational psychology seeks to know the child's mind which is unsophisticated. In fact educational psychology seeks to know the child's mind, which as unsophisticated, is the fittest objective for educational study. It is also concerned with the questions like how does the child learn the use of language? What part do children's drawings play in their education? etc.

Davis¹ discusses the importance of educational psychology as follows:

"Psychology has made a distinct contribution to education through its analysis of pupil potentialities and differences as revealed by means of various types of psychological tests. It has also contributed directly to the knowledge of pupil growth and maturation during the school years."

Blair² has discussed the importance of educational psychology in the following words: "Modern teacher, if he is to succeed with his work, should be a specialist who understands children, how they grow, develop, learn and adjust. He should be diagnostician who can discover special difficulties of children and at the same time possesses the requisite skill for carrying forward the necessary remedial work. He should also be performing important educational and vocational guidance functions. No person untrained in the methods of psychology can possibly fulfil the obligations and tasks which are the responsibilities of the teacher."

Kelly³ has analysed the task of educational psychology as follows:

1. To give a knowledge of the nature of the child;
2. To give understanding of the nature, aims and purposes of education;

1. Davis, R.A., "Applicability of Applications of Psychology with Particular Reference to Classroom Learning." *Journal of Educational Research*, 1943, 37, 19-30.
2. Blair, G.M., *The Psychological Interpretation of Teaching Educational Administration and Supervision*, 1947, 33, 321-338.
3. Kelly, W.A., "The Functions of the Course in Educational Psychology." *Catholic Education Review*, 1941, 39, 590-598.

3. To give understanding of the scientific methods and procedures which have been used in arriving at the facts and principles of educational psychology;
4. To present the principles and techniques of learning and teaching;
5. To give training in methods of measuring abilities and achievement in school subjects;
6. To give a knowledge of the growth and development of children;
7. To assist in the better adjustment of children and to help them to prevent their maladjustment;
8. To study the educational significance and the control of emotions; and
9. To give an understanding of the principles and techniques of correct training.

History of Educational Psychology

The following educationists and psychologists have helped the growth of educational psychology in its varied forms:

Rousseau (1712-1778) pleaded for individual freedom, self-expression and learning through experiences. Other educationists such as Johann Pestalozzi (1746-1827), John Friedrich Herbart (1776-1841) and Friedrich Froebel (1782-1827) were also positive reformers in education. For example, Pestalozzi advocated education through sense perception, reasoning and the use of real objects. Herbart contributed five formal steps of learning, viz., (i) preparation; (ii) presentation; (iii) comparison or association of new with old ideas; (iv) association or generalisation; and (v) application. Froebel demanded that education be adopted to the psychological needs and social nature of the child. The followers of Herbart became most influential. They accepted two main principles, first intellectual development through combination of ideas and second, character development through acquisition of ethical ideas.

Shortly after the middle of the nineteenth century came the revolutionary influence of Darwin, who in 1859, supported the doctrine of evolution by means of abundant evidence, leading significant researches in animal psychology and human heredity. In 1869, Francis Galton (1822-1911) set forth his famous studies on the inheritance of genius. He completed numerous investigations of mental imagery and individual differences. There followed the experiments of Wilhelm Wundt (1832-1920), who contributed many psychological findings applicable to education. Stanley Hall (1844-

1924) gave useful principles governing the stages of human growth and thus gave impetus to the child study movement. Hall also devised a questionnaire method of investigation. As symbols of the new faith in science, Herbert Spencer (1820-1895) and Charles W. Elliot (1834-1926) became foremost exponents of science studies in the field of formal education.

In America, two pragmatists William James (1841-1910) and John Dewey (1859-1952) insisted on strictly practical and scientific analysis in psychology. William James pleaded for experimentation with the problems of emotional, intellectual and moral development. He conducted significant studies on memory, the transfer of training and emotional responses. He attributed emotional experience to awareness of bodily changes. Dewey emphasised the Project Method of learning.

Towards the end of the nineteenth century, Mckeen Cattell (1860-1944) represented the movement of tests and measurement. Besides him, other psychologists like Pearson and Thorndike represented the field of testing. Thus the field of testing grew rapidly and standardised tests of intelligence, aptitudes, achievement became valuable tools in educational psychology.

During the first half of this century, W.B. Cannon (1871-1945), John B. Watson (1878-1958), Pavlov (1849-1936), Werthemer (1880-1943), Koffka (1886-1941) and Kohler (1887) contributed to the field of educational psychology. Cannon studied emotional behaviour especially relations between emotions and the adrenal glands. Watson investigated animal psychology, particularly maze learning and described the emotional reaction of individual infant and founded the behaviouristic school of psychology. Pavlov made researches on the conditioned responses of dogs and the use of conditioning to induce frustration in animals. Werthemer, Koffka and Kohler developed Gestalt theories in considerable detail. Besides these, Kurt Lewin (1890-1947) studied child personality as a whole and the development of inner conflicts and frustration. Sigmund Freud (1856-1939) founded the school of psycho-analysis and stressed sexual desire, repression of such desire and repressed past experiences as the factors responsible for abnormal behaviour. According to Freud, the individual's motives must be redirected and free-self-expression encouraged. Alfred Adler (1870-1937) postulated a will-to-power as the driving force of human behaviour, assuming that frustration of this force causes an inferiority complex. Carl Gustav Jung (1875-1961) set forth a similar principle, i.e., will to live. He advocated treatment of neuroses by analysis of the individual's immediate environment and needed adjustments to that environment. For this purpose he devised a free association test.

Thus, all educationists and psychologists from Rousseau to

Jung contributed a lot towards the development of emotional psychology.

Scope of Educational Psychology

There would appear to be five major areas: human growth and development; learning; personality and adjustment; measurement and evaluation; and techniques and methods in educational psychology. The more important sub-headings under each division are as follows:

I. Human growth and development.

- (a) Heredity and environment;
- (b) General growth and development;
- (c) Social and emotional development;
- (d) Motivation;
- (e) Individual differences;
- (f) Intelligence, aptitudes, interests.

II. Learning.

- (a) General nature of learning;
- (b) Factors influencing learning;
- (c) Motivation and devices in teaching;
- (d) Skills;
- (e) Reasoning and problem solving;
- (f) Attitude;
- (g) Learning of particular school steps;
- (h) Transfer of training.

III. Personality and adjustment.

- (a) Emotions;
- (b) Mental life of the people;
- (c) Mental health of the teacher;
- (d) Exceptional children;
- (e) Character;
- (f) Social interaction.

IV. Measurement and evaluation.

- (a) Basic principles of measurement;
- (b) Measurement of intelligence and aptitudes;
- (c) Measurement of learning;
- (d) Measurement of adjustment;
- (e) Applications on results of measurement.

V. Techniques and methods in educational psychology.

- (a) Scientific study of educational problems;
- (b) Statistical techniques;
- (c) Implementation of research for the classroom teacher.

In short, whatever is educational or whatever touches the child in his classroom behaviour comes within the scope of educational psychology. All the above five areas come within the scope of educational psychology.

Educational Psychology and Its Importance for the Teacher

Educational psychology helps teachers in accomplishing the following aims which are also its goals and objectives.

Firstly, educational psychology aims at helping the teacher in widening and enriching his own personal life by the enrichment of his knowledge, by the edification of his thought level, by modification of his attitudes, his goals, his ideals, his standard of values, his conduct and his feelings. In this way educational psychology tries to discharge the cultural aim.

Secondly, educational psychology aims at helping the teacher in bringing about improvement in the quality of his instructions and in promoting increased improvement in the teaching service at schools. From this angle, the aim of educational psychology is to train a teacher professionally. It aims at promoting, as has been mentioned earlier, effective learning and teaching and at fostering the growth and development of wholesome personality by increasing the teacher's ability for intelligent self-direction in the changing social order. It enables the educator to understand human nature better. In this manner, educational psychology helps a teacher to motivate effectively the child and direct him suitably towards learning and growth. The second aim is thus professional. Thus, problems and objectives of educational psychology answer two questions:

- (i) How of the learning process? and
- (ii) Why of the learning process?

The question of how a pupil should be taught and when he should be rewarded or punished are to be answered by it. Other related question is—should the nature of the child be ignored? These questions fall within the functions of educational psychology.

Thus, in simple words, the aim of educational psychology is to enable the teacher to realise the two aims. First is cultural and the second is professional. Above all, educational psychology develops a sense of realisation in the educator. It also helps the teacher through the cultivation in him of the right attitudes towards human development and pupil learning. In short, aims and objectives of educational psychology help the teacher with the information and suitable methods with the help of which he can improve his teaching skills and also ensure desirable growth in the personality of the pupil.

Educational psychology has produced a variety of impacts on the teacher and the teaching skills. This impact has been noted in three fields: (i) Educational administration; (ii) in the curriculum; and (iii) in the teacher-training. A detailed explanation of the nature of the impact is given below.

Educational psychology has helped the teacher by providing him with a point of view on the educational process, on educational product and on educational situations of the learner. By providing him with enriched experiences, it has helped him in obtaining a frame of reference on human responses and on educational situations, on agencies of education, on the nature of teaching and many more. Without the knowledge of these a teacher would have groped in the dark. This knowledge and point of view has helped him in securing interest and economy of time and effort in learning. It has also endowed him with an appreciative mind with which he is able to maintain an atmosphere in the classroom that is conducive to good mental health in pupils. Further, it has also provided him with the knowledge on the genesis and development of personality and the causes of emotional maladjustment and other related problems. Educational psychology has enabled him to make use of intelligence tests, rating scales, achievement tests, interest schedules and aptitude tests. In short, teacher can utilise all tests for studying and assessing various potentialities and proficiencies in the various fields of academic and non-academic areas of pupils.

Educational psychology has also brought marked changes in the contents of the curriculum with the help of new research findings. It has also brought increasing emphasis on the methods and procedures which would inculcate democratic attitudes and habits among pupils. As a result of this, many changes have occurred in the school curriculum. Above all, educational psychology has also helped in changing the curriculum on the psychological needs of children instead of making it 'subject-matter-centred'; it has helped to obtain a child-centred curriculum by emphasising children motives and their social needs. The role played by educational psychology in shaping the curricular activities are evident in the scheme of Basic education in India and in Pragmatic education of Dewey in the United States. In other words educational psychology has provided basic psychological concepts in educational administration. It has highlighted the changing concepts of the aims and responsibilities of administration. In short, it has brought the learner and the learning process in the centre.

Besides, educational psychology has provided 'non-directive' point of view for the classroom teacher. 'Non-directive' that emphasises the importance of development of initiative, enterprise and problem-solving attitudes in the learner. It also stresses cooperative effort in teaching. It has also introduced another

psychological concept like 'self-concept' for the teacher. This self-concept helps teacher in many ways. Inside the classroom, educational psychology has enabled the teacher to achieve proper conditioning of pupils by achieving and directing class-room programmes on human lines. As a result of this condition, students may develop better attitudes of leadership.

Educational psychology also recognises the normative needs of children. As a result of this, subject-matter of the curriculum is related to high level of motivation and needs of the children. This is an important achievement of educational psychology in the matter of curriculum. To sum up, the impact of educational psychology on the teacher and on the teaching process has been varied and deep. Without its help education will be non-psychological and lack romantic and human background.

Methods in Educational Psychology

Opinions differ with regard to the proper method of psychological investigation. According to some, introspection is the psychological method *par excellence*. Others point their accusing finger at introspection as subjective and unscientific in character and approve of observation as the psychological method proper. Still others hold that neither observation nor introspection but their combination into the experimental is the adequate method for psychology. Some psychologists, again, are in favour of the genetic method, which consists in the developmental study of mind. But as a method of exposition it is not exclusive of observation and introspection. Again, closely related to it is the comparative method, which studies the development of adult human mind in comparison with that of the child and the animal. Some psychologists prefer clinical and case history methods. In recent years, there has been emphasis on statistical and differential methods. We shall discuss these methods in detail as under:

1. Introspection

Introspection is called the psychological method *par excellence*. It consists in deliberately looking within one's own mind for observing what goes on there. As mental processes occur within the mind, these have to be observed by reflexively turning the mind upon itself. An individual cannot directly perceive the mind of another. But he can observe his own mind himself. So, introspection is self-observation. The subject of experience alone is capable of introspecting his own mind. So, introspection is called also the subjective method. For example, a man absorbed in watching the waves of the ocean may be intercepted by an observer with the question as to what he is doing. The man's objective point of view is at once converted into the subjective one. He answers that he has been watching the waves. So long his mind has been attending to an outside object. But now he attends to

the mental activity of attending to the object. Or, so long he had been observing or inspecting an object of his mind. But now he introspects his mind itself. Here, the subject is critical of the contents of his own mind. He raises doubts about them and puts questions about them to himself, as for example, whether he was really engrossed in watching waves or was thinking of something else, or whether he was enjoying the open sea-breeze or feeling uncomfortable. But though the second stage is reflective, it is unscientific still. At the third stage the subject passes over to the scientific one of explicit self-consciousness. Here his sole interest lies in the acquisition of theoretical knowledge. He asks himself questions about the workings of his mind in the interest of scientific rather than of personal interests. For example, he asks himself if it is possible for the mind to maintain continuous attention without its fluctuation. This stage of explicit self-consciousness is introspection proper. In simple words, let us say then that introspection is self-examination or watching one's own mental processes conducted with the sole motive of acquiring self-knowledge.

In spite of many advantages, introspection is attended with serious difficulties, for example, the natural bent of mind, it is objected, is extrospective and not introspective. We perceive external objects more easily than we do mental processes. It has also been urged against introspection that it is not worthwhile, for mental processes as its objects are vague and ill-defined. It is, again, objected that introspection of a mental process distorts instead of knowing it. The very attempt at introspecting the mind interferes with its normal course.

Maudsley in his *Physiology of Mind* points out that introspection turns out objectless and defeats itself, for in introspecting a mental process attention is fixed upon it and withdrawn from its object. But the mental process, in the absence of its object, ceases to exist. Thus introspection misses its object. Another disadvantage of introspection is that mental processes introspected are in a state of constant fluctuation. They cannot be detained like stocks and stones so that we may observe them. They pass away no sooner than they appear leaving no time for them to be introspected. This difficulty may be met in the same way as the previous one. Besides, mental processes which disappear no sooner than they appear, can be reproduced again and again and introspected in part on different occasions till a whole view of it can be had. Thirdly, the collaboration of introspection also enables the psychologists to get a complete account of a mental process.

So, we may conclude that introspection, in spite of its criticism, is quite practicable and advisable as a method of psychology. But left to itself, it does not constitute the whole method of psychology. In order to be so, it must be supplemented by the method of inspection or observation and brought under the control of standard conditions as in the experimental method of psychology.

2. *Observation*

Observation or inspection consists in perceiving or watching an object with the senses in order to have its theoretical knowledge. With this end in view science observes its object analysing it, eliminating the accidental and selecting the essential factors of it, finally arriving at some general laws concerning it. In psychology also observation plays an important role. A mental process has two aspects, viz., its internal core and its outer manifestations. The former is accessible to introspection alone, while the latter is open to external observation. Each of these two aspects mutilated from the other, gives only a partial view of the mind, which to be known fully, requires the joint efforts of introspection on the one hand and of observation on the other.

The scope of observation in psychology is a vast one. Any external manifestation of the individual and collective mind is its object. Art, literature, science, philosophy and all other products of the human mind, individual and collective as well, are the objects of observation. The artistic excellence of an Abanindranath, the poetic genius of a Rabindranath, the philosophical depth of a Plato or Sankara, in short, everything human is preserved or embodied in outer manifestations. The customs and manners, the rites and rituals, the humiliations and triumphs of a nation or race reflect their mind. Different organisations and institutions like temples, churches, mosques, clubs, committees, sculptural and architectural creations are the condensed expression of the human mind at work. And with all these among other objects is psychological observation concerned.

The method of psychological observation or inspection enjoys many advantages. Observation is the natural and normal way of knowing not only the external world, but also the mind. The mind is habitually bent upon external observation. To know the mind through the external observation of its external manifestations is a general psychological method. Besides, observation is the sole means to get the knowledge of others' minds, for they cannot be directly introspected. Observation of the outward manifestations of their mental activities is the only method at our disposal to know the minds of others. Again, the part played by observation in knowing one's own mind is not negligible. Introspection gives an incomplete knowledge of one's own mind. It enables us to know only its core, while its outer manifestations which constitute its embodiment, remain inaccessible to it. Observation comes to the aid of introspection and removes this gap in the knowledge of our own mind. Introspection is of little help in the knowledge of the social or collective mind as reflected in the family, society, state and the nation. Observation of their customs and manners, rites and rituals, rules and prohibitions among other forms of behaviour, is necessary for their knowledge. Moreover, children, idiots,

savages, lunatics and animals are incapable of introspecting their mental processes. Observation is the sole method of studying these minds.

But the disadvantages of the method of observation in psychology must also be noted and guarded against. Much caution should be exercised in observing the minds of others. Observation is the method of knowing the mind through the perception of its external manifestations. But such knowledge is liable to be mistaken on various grounds. For example, different mental processes may have similar external manifestations. There are tears of joy and those of sorrow. So, it is difficult to guess at a mental process by observing its outward manifestations. Again, the same mental process may have different outward manifestations. Pleasure may make one calm and quiet, while another restless and unbalanced. Thus observation of external manifestations as a means to know the mental processes tends to be mistaken. Another mistake of observation occurs when we perceive the outer manifestations of minds different from ours. It is difficult to observe the behaviour of lower animals from their expressions. We are prone to understanding the animal mind in terms of our own and attributing to it a much higher degree of intelligence than what really belongs to it. As a precaution against such misinterpretation, we should observe the law of parsimony or, as Wundt says, the approved maxim of the exact natural sciences that we should always have recourse to the simplest explanation possible. "Lloyd Morgan's Canon" cautions us against the same error. Hence, observation cannot be an independent method of psychology. It is, on the other hand, based on introspection. Lastly, though observation enjoys a vast range, the subconscious, the pre-conscious and the unconscious levels of mind are outside its scope.

The objections raised against observation and introspection lose their force when the two are combined with each other. For example, the alleged subjectivism and individualism of introspection disappear when it is joined with observation. As a matter of fact, the proper psychological method lies in combining introspection with observation.

The mind has two aspects, viz., its internal core and its external husk. Introspection has access into the former, while observation knows the latter. Each method is a necessary complement of the other in having the whole view of a mental process. For example, the feeling of pleasure has an inner nature which is accessible to that person only who has it. He has direct acquaintance with this internal core of feeling through introspection. But hand in hand with the inner core, feeling has also bodily manifestations, like smiling, sobbing, deep breathing, reddened eyes, clenched fists and the like. Without the knowledge of these bodily changes, the feeling of pleasure is known in part and not as a whole. These

outward manifestations can only be observed, just as the internal core can only be introspected. Thus, introspection supplements the onesidedness of observation, just as the latter does that of the former. The two combined together give us the complete picture of a mental process.

3. *The Experimental Method*

Science does not depend upon her objects happening merely by the bounty of nature. She interrogates nature and brings her under experimental control. If psychology has to be a science, mental processes must not be left alone to occur automatically, but they must be made to occur or be reproduced artificially under standard conditions, so that they can be studied whenever necessary. The experimental method of psychology means the method of scientifically studying mental processes. Experimental Psychology is that science which investigates mental processes by the application of the experimental method of study. The problem then, of the experimental method of psychology is how to observe the manifestations of mental processes and introspect their inward nature or core under prearranged or test conditions.

Experimentation is the most dependable method of research. It emphasises accurate observation, the collection and arrangement of pertinent data, the formulation of careful hypothesis, development of tentative explanatory theories by trial under controlled conditions. This is a method which is called by its very nature the method of difference. Experiments may be conducted in the laboratory or in the classroom or anywhere else in the community. Experimentation involves comparison between behaviour of a control group and that of an experimental group. The experimenter tries to isolate the factor responsible for differential behaviour in the two types of groups. Experimental method needs careful observation and procedure. For the success of this method ideal conditions for their use have to be ensured. However, all the problems of educational psychology are not susceptible to the treatment of this method.

The experimental method of psychology normally involves the cooperation, at least, of two persons. The psychologist, himself is the experimenter and the individual whose mind is studied is the subject. The first arranges the conditions of the experiment. For example, he brings the environmental factors of the laboratory, like light and air under control, takes proper care so that the subject feels comfortable, sets in order the tools and instruments needed in the experiment, instructs the subject about his response to the stimulus presented by the experimenter himself, and about the introspective report of the subject's experience to be submitted by the latter. The experimenter on his part, has to observe the outward manifestations of the subject's behaviour in the different periods of his making the

response. Lastly, the function of the experiment consists in finding out the results of the experiment on the basis of the subject's introspection combined with his own observation. He makes use of various statistical methods in order to ascertain the results of the experiment, for their scientific value depends upon the application of mathematics to their calculation and formulation.

The experimental method aims at studying the subject's responses to the stimulus presented to him by the experimenter. The given stimulus may be associated with a number of other stimuli. In a psychological experiment these irrelevant stimuli and their responses remain constant, while the relevant stimulus is varied in order to study how the response to it varies concomitantly. So, the former i.e. the relevant stimulus is called the independent variable, while the latter is called the dependent variable. The theory underlying this distinction is that if in a number of instances with all other circumstances remaining constant, the variation of one is connected with that of another, the independently varying one is the cause in relation to the dependently varying one which is the effect.

The experimental method of psychology is attended with a number of difficulties. (1) As constantly fluctuating in character, mental processes cannot be detained for the purpose of experimental study. (2) The artificial situation of the laboratory interferes with the normal flow of mental life and distorts it. (3) The subject may seek to please the experimenter by making responses which he likes and may thus vitiate the main purpose of the experiment. (4) Lastly there are some mental processes like emotion which are difficult to be experimented upon.

In answer to the above difficulties, it may be pointed out that (1) even fluctuating mental processes may be repeated and experimented upon again and again; (2) the subject may be so trained as not to seek to satisfy the experimenter; moreover, experiments may be made on a large number of subjects to minimise this difficulty; (3) the artificial situation of the psychology laboratory may be removed by taking necessary care and precaution; and (4) emotions and other mental processes not amenable to experiment, may be experimented upon by proper practice and training.

The experimental method of psychology enjoys a number of advantages over other methods. (1) It does not wait for a mental process to happen by the bounty of nature, but reproduces it as many times as required for the purpose of studying it. (2) This method can isolate a mental process from its accidental accompaniments and investigate it apart from them. (3) It can have the whole view of a mental process including its internal and external aspects. (4) It can study a mental process as related to the bodily changes associated with it. (5) Lastly, this method discovers psychological laws by studying the results arrived at quantitatively. The

quantitative determination of the results is made possible with the help of mathematical and statistical calculations. Thus, it raises psychology from a speculative to an experimental science.

4. *The Genetic Method*

The above methods provide psychology with its data. So, they may be called observational methods. But the supply of data is not enough, for their explanation is also necessary. The genetic method is an explanatory method of psychology bringing out the genesis and development of a mental process. So, it may also be called a developmental method. The mind is not a permanent entity, which, even if it be so, is of no concern to psychology. Mental processes are the results of a long course of evolution. So, the question of vital interest is, what are the development stages of the mind from its earliest to the present stage? The genetic method seeks to answer this question.

The genetic method bears a close relation to the analytical method, for it aims at studying the gradual development of the adult mind by its analysis. Ward, Stout and McDougall, among other psychologists, combine the genetic with the analytical method. Genetic Psychology is that which investigates the mind with this method.

The genetic method presents us with the following among other facts and theories of mental life. (1) The mind is in a process of constant change. It does not stay even for a moment. (2) The mind is a continuity and there is no gap anywhere in our mental life. (3) Each successive mental process is new, though it is the continuation of an antecedent one. (4) Mental processes are governed by the laws of uniformity and causation. (5) Simple and complex mental processes are connected together as antecedents and consequents respectively.

This method is specially applicable to child psychology. It investigates the development and growth of the child mind. It raises questions like what the native or hereditary faculties of the mind are; how environment influences its development; if child behaviour is determined by instincts or acquired and more or less influenced by intelligence, what intelligence is; how it is determined; what the remedies of feeble-mindedness and delinquency and how social consciousness arises and develops?

On the basis of a genetic study, the evolution of the child mind is divided into different periods. The child's infancy extends from birth to his eighteen months of age. The babyhood continues till he is seven years old. The next period of adolescence extends over twenty years of age. Child psychology investigates the periods of human life upto adolescence only, while genetic psychology carries its investigation till the last period of human

life, when death cuts it short. The next phases of human life are youth running upto thirty years, middle age extending over the next twenty years, maturity lengthened to sixty, early old age covering the next ten years, old age comprising the next ten, senile old age covering the next ten years, thus advancing man to the ripe old age of ninety, finally ending in death.

The genetic method throws light on the dynamic nature of the mind. It treats mind from the evolutionary point of view. Therefore, it is modern in its scientific outlook. Yet it tends to ignore the self, without which, as Stout, among other psychologists holds, the unity and continuity of mental life are rendered inexplicable. Moreover, in explaining the development of the childmind, it tends to apply the yard-stick of the adult mind. But these disadvantages do not make the genetic method scientifically valueless. Rather emphasising the evolutionary nature of the mind, as it does, it follows the path of science.

5. *Differential Methods*

The differential methods in psychology are employed to study various relationships and associations between two variables. In the process of seeking association or relationship, various statistical methods have been devised, and perfected. Since the statistical approach and analysis is the dominant part of the method, the differential methods have the important influence of statistical methods. Statistical techniques have shown to be the major devices for differential methods which deal with problems of the individual differences.

The differential methods have been adopted in quite a number of situations to study the relationship of one variable to other. However, it is felt by various authors that differential method is not quite adequate to study the relationship of one variable to other. It is also felt that differential method is not quite adequate to study the behaviour problems in details as is done by the experimental methods. This may be so because many observations and aspects of behaviour cannot be subjected to statistical analysis. However, Andrews states that "at the first view of the differentiation between experiments and differential methods may appear to be quite artificial and it is true that all psychologists will not agree to such an apparently artificial classification scheme. Nevertheless, it should always be made clear that the independent variables resulting from individual differences are never under the investigator's control to the same degree that experimental variables are." However, the utility of this method for the purposes of prediction of behaviour is evident and this method has shown quite useful purpose in investigation where longitudinal and cross-sectional approaches have become very important tools of research in psychology particularly the latter while studying the problems of teaching moral and attitude formation. The longitudinal methods have been used in the studies of infants. In these studies biographical

dates have shown to be of greater value and help. The cross-sectional method has been used to study traits and their development etc.

6. Case Studies

Case study involves the intensive investigation of the particular case. It aims at studying everything about something rather than something about everything. Case study takes into account all the pertinent factors especially of a thing or situation. The case may consist of data relating to the life history of a case or other life processes. Case study often includes the analysis of an individual's life history, health record, home environment, progress, social relations and psychological equipment. Anecdotal records of special episodes may be part of the basic data in a case study of a child development. Coville and others have included the following data in case study:

1. Identifying data (name, age etc).
2. Statement of present problem (symptoms and complaints).
3. Health history (illness, serious disease, surgical operations).
4. Developmental history (course of growth in infancy and childhood, maturation).
5. Family history (description of the family constellation, its health history and interpersonal relationships).
6. Educational history (school and college progress).
7. Work history (record of occupations, length of service, general occupational adjustment).
8. Patient's interpersonal relationships (patient's attitude and behaviour towards others in various aspects of his life experience).
9. Psychosexual history (sexual habits and attitudes of patient).
10. Marital history (statement of marital status and description of marital adjustment).
11. Special personal habits and interests (talents, skills, hobbies).
12. Personality traits (description of mannerisms, reactions, moods and emotional patterns of the patient).

7. Clinical Methods

Clinical methods are assortment of different methods and

include, more or less objective methods. Through clinical methods, personal description of the trait or of personal information is enlisted. It includes the following:

(i) clinical test; (ii) psycho-diagnostics; (iii) counselling; (iv) application and use of the autobiographical records; (v) the case histories; (vi) the interviews; and (vii) inventory.

Clinical methods involve an intensive study of individuals. Many behavioural problems of personality have been investigated by clinical methods.

The psychological examination is conducted by the clinical psychologist. Although he also uses the interview technique, his principal function in the diagnostic team is the administration and interception of a battery of psychological tests which may vary in content from one type of diagnostic problem to another. It is the psychologist's responsibility to select the test battery to be employed with the particular patient. He may include tests of intelligence, aptitude, special functions, interests and personality. The personality tests constitute the significant core of the typical test battery.

8. Statistical Method

Statistics involve the enumeration, classification, correlation and interpretation of data. Statistics have an important part to play in educational psychology. Performance must be measured in terms of mathematics. Tests are used for the measurement of physical, emotional and mental trait, capacity, accomplishments and needs. During the past seventy years progress in statistical methods and the development of the standardised tests have helped to build the scientific foundations of educational psychology.

Conclusion

From the above discussions it becomes clear that educational psychology studies the problems of behaviour. Thus problems of behaviour include consideration of human equipment, instincts, reflexes, temperament, motives, behaviour, affections, psycho-physical structure and disposition of desire.

Secondly, educational psychology studies the problems of learning which includes consideration of responses of learning situation, practice and drill, motivation, method of learning, ability of learning, transfer of training, psychology of school subjects, intellectual understanding, association and growth.

Thirdly, the educational psychology studies the problems of individual's differences which includes consideration of the stages and types of growth among individuals and groups, the analysis

of differential deeds and the results of the statistical procedure.

In simple words, a thorough mastery of educational psychology aids the seacher to gain understanding of the pupil's motives and to provide for his needs. Study of the laws and proper conditions of learning help teachers to adjust their activities to the requirements of child and community. Educational psychology also helps to shed light on effective methods of study and learning and it also clarifies human motives and thus makes it possible to achieve better understanding among individuals and groups. The scientific data of educational psychology are potentially useful aids in the field of school, home, community and all these i.e., school, home and community will derive immense benefit if they will adjust their practices to the needs of child as disclosed by the researches in educational psychology.

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CHILD DEVELOPMENT

THE entire period of physical and mental immaturity is termed as child development. The period begins with conception and ends on the attainment of full adulthood. Until recently, child development began at the time of child's birth. Today, it is recognised that many things of great significance to the postnatal development occur before birth. If we want to understand patterns of child development fully, well we must know what happens to the child before he is born. Consequently, the meaning of child development encompasses that span of time which begins with conception and extends to the period of adolescence.

Historical Studies of Child Development

Research in the field of child development is of comparatively recent origin. Before 1900 there were only occasional instances of measurements of growth. These were concerned with increments in size (usually height and weight). According to Monroe¹ the earliest recorded series of observations is that made by P. Gueneauds Montveillard on the height of his son from birth to 18 years. Other notable early studies of physical growth are those of Qvetelet, Boas, Putier and Bowditch. Moore and Sully made observations of the behavioural development of children and were based on diary notes which had been made on one or two infants.

The publications of Binet 1918 and 1911 gave a great impetus to the study of mental growth. Other investigations of developmental aspects of child psychology were made under the leadership of such men as G. Stanley Hall and Earl Barnes. However, much of this material was speculative as it was based on questionnaires.

The first systematic study of physical and mental growth was made by Bird T. Baldwin who also studied the interrelationships and dependencies of various aspects of growth. Baldwin

1. *Encyclopaedia of Educational Research*. The Macmillan Company, New York, 1952.

was among the first to investigate the interrelationships between mental and physical developments and to study the consistency of I. Q. from series of repeated tests.

Starting around 1920, there was a great upswing of interest in securing accurate information about the growth and development of children. Terman in 1921 made a follow up study of 1000 gifted children who had been studied first in 1917. Garrel published in 1925 his first account of his studies of behavioural development in infants and young children. Following Garrel's first publications, the general emphasis of research in child development shifted to studies of early infancy.

Importance of Child Study

The study of children is an important business. Firstly, a better knowledge of children and their development contributes in a very practical way to human betterment. Secondly, a better understanding of children has many practical implications for a theory of human behaviour. Third, achievement of sound mental health stems from the proper development of children.

The study of child is very important to the profession of home making, teaching and other sectors of child welfare and if we realise the importance of child study we can contribute more to the welfare of children and thus to the building of a better world.

Child study means a scientific study of the individual from his pre-natal beginning to the early stages of his adolescent development. Child study deals with (1) the stages of growth and maturation of the child; (2) the effects of environmental influences upon child's pattern of development; (3) the psychological and social interactions between a child and the other members of the society into which he is born and in which he is reared.

Child study is an area of study which draws upon many disciplines such as biology, physiology, psychology, home science and education in an attempt to understand children. Child study represents a body of knowledge gleaned from many sources and includes every area of development i.e., physical, mental, emotional and social.

The study of children is of vital concern to us. If one is to understand human beings at any stage of their growth, it is important to study their beginnings. It can lead to greater understanding of the individual child and to recognition of the factors and influences that make each child unique. Much of what children do is a direct result of the growth process, but some behaviour is caused by the interaction of the child with his environment.

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Studying children offers us an opportunity to discover what they are like and why they behave in a certain way. With the help of child study, we become aware of children, as growing individuals with needs, desires and feelings. When we are aware of the cultural, physical, emotional, social and intellectual factors that effect the child's behaviour, it becomes easier to guide children constructively.

Child study provides us with a background for the better understanding of adult behaviour. Child study increases our ability to understand others and ourselves. One can gain insight in one's own behaviour. We also see new meaning in the behaviour of adults.

Parents, teachers and other adults who are interested in the welfare of the individual and society have become aware of the significance of child study. During all the stages of growth, a child requires sufficient and intelligent care of his physical needs. He also needs trained guidance of his mental, emotional and social potentialities. It has been found that insufficient care during childhood years results in abnormal development. It is also accompanied by the development of undesirable attitudes. In America it has been found that inadequate care and understanding by parents result in personal and social maladjustments.

Thinkers like Rousseau, Pestalozzi, Froebel and Tagore have made it clear that teaching must be based on nature of the child. We must find out what sort of child we have to deal with and accommodate our methods to the laws of his nature. The study of children and their ways must be our primary task. All children have needs of love, security and affection. If we want that the child should develop his full personality, then we must adequately satisfy his needs at home and school. He should be developed in a favourable social and emotional environment.

The study of children also means the study of their parents and their relationship with children, knowledge of social and cultural values which they learn and their relationship with sisters and brothers. Parents must also understand that child's learning is most affected by parent-child relationship as well as values held up in the home.

Recent investigations in psychology have revealed to us the fact that the child be brought up in an atmosphere of freedom. Too many restrictions should not be imposed upon him; it is only in an atmosphere of freedom that the child can develop his innate powers spontaneously. Impositions are of no use. Punishments have no value as the child has no correct conception of wrong or why punishment is given. Child must have his own way.

Froebel studied childhood period very carefully. He discovered much similarity between child and a plant because the child grows spontaneously just as the plant grows naturally. The plant throws out leaves and branches within according to the seed which is within it; in the same way, the child grows because of the tendencies and impulses within him. Froebel also discovered that the real growth and development is possible only through self activity that the child realises his own nature and develops his own individuality. Froebel maintained that the individual child can only be properly educated in the company of other children. The life of the child is bound up with the life of the society.

Therefore, during all the stages of his growth a child requires intelligent care of his physical needs and trained guidance of his mental, emotional and social potentialities. Insufficient care during childhood years produces bad effects. Inadequate parental understanding and care results also in personal and social maladjustment. We must understand how the child grows, and the way he grows depends on the kind of child he is, and experiences he had, and that parents and teachers can influence his growth by the way with feel and act towards him. We must also recognise this fact that each child develops according to an orderly sequence, common to all children in general, but unique in some respect to him. The baby sits up before he creeps, creeps before he stands, stands before he walks, walks before he runs. This development may be modified by illness and other favourable environmental conditions.

Children do not just grow. They need guidance. We must understand children and suggest ways and means of improving their behaviour. Suppose a child of three years says, "I wont" or "No" to every request. What should the parents do? Suppose that a child of five screams and kicks when he has to come in from play? Why does he behave in this way? Or perhaps a six-year-old child does anything he is told to do, but nothing on his own initiative. How can the teacher help him to develop independence and self-reliance? In another instance, a third primary child, equal in intelligence to other children in his class, is the only one who has not learnt to read. Why not? What should be done about it? If the third primary girl is timid and seclusive, what can the teacher do to further best development? We need to learn how to help children grow in their own best way. What are the most efficient ways of helping children at different stages of maturity learn, the ways of civilised life, to read, to work and play constructively with others to develop skill of living in groups? How can we teach them to formulate notions into action? How can we teach them the art of economical learning? How to learn and how to solve problems within the range of their experiences? Innumerable situations of this

nature continually arise in the process of educating children and thus help us in studying the child.

Importance of Home in Child's Life

The White House Conference of America has suggested to us a statement of what a good home contributes to a child's life today and for all his future life.

1. Meets needs of child for security; through parents affection, understanding and consideration and through the accepted place of the family in the community, its unity and its economic stability.

2. Meets needs of child for accomplishment; through opportunities for work, with enough success to encourage endeavour; through opportunities for helpful service to others; through freedom from interference with natural desires for achievement.

3. Provides early healthy care; through diet, clothing, sleep, rest, play; through medical supervision, protection from fatigue; overstrain and infection.

4. Provides early social training; through experience with other children under supervision; through vocational guidance; through training in manners and morals; through help in learning to live in harmony with aims and objects of other people.

5. Provides opportunities for mental development; through encouragement to do for himself; through answering questions; through giving him space and material for play.

6. Assists child in orientation in developing his means of life, his concept of God and his scheme of Universe.

The ideal family would provide for a child a friendly and hospitable environment for the development of his emotions and abilities and secure relationship in a group of dignified social status wherein he was loved, protected and encouraged.

Stages of Child Development

Psychologists have conveniently divided the life span of the individual into age groupings which have some common development or practical characteristic. Individual differences are so great that grouping sometimes becomes difficult. However, the following classification for the period of growth is one of the most widely used :

Name of period

Approximate ages

1. Pre natal
Ovum

From 0 to 250 or 300 days.
From 0 to 2 weeks.

Embryo	From 2 to 10 weeks.
Foetus	From 10 weeks to birth.
Birth	Average at 280 days.
2. Neonate	First two weeks of post-natal life.
3. Infancy	First two years.
4. Early childhood	From 2 to 6 years.
5. Middle childhood	From 6 to 10 years.
6. Later childhood (pre-puberty)	From 10 to 13 years.
7. Puberty	Average for girls 12 years. Average for boys 14 years.
8. Early adolescence	From 13 to 15 years.
9. Later adolescence	From 15 to 20 years.
10. Adulthood	Age 20 years and beyond.

Legally life begins at birth; biologically it begins at conception. That is why birth is merely an interruption of the developmental pattern. This interruption is characterised by a graduation from the internal to the external environment.

A. Pre-natal Period

The pre-natal period of human existence extends from conception to birth (normally 280 days). This period may be divided into the following successive stages:

- (a) the germinal: first two weeks following fertilization of ovum;
- (b) the embryonic extending from implantation of the fertilized ovum in the uterus until about sixth week of development;
- (c) the fetal from 10th week until birth.

During the entire pre-natal period the developing organism is dependent upon the mother for the digestion of food, the excretion of waste products, external respiration and the maintenance of requisite body temperature.

There are two important reasons for studying the pre-natal period. Firstly, it is the foundation age. What a child will ultimately be is largely determined by what happens to him before he is born. At this time hereditary endowment is fixed,

once and for all. Favourable pre-natal environmental conditions can foster the development of hereditary potentials just as unfavourable conditions can stunt their development. Secondly, knowing what happens to a child before he is born is essential to a complete understanding of the patterns of human development. In spite of the fact that growth and development are very rapid during the short time before the baby is born, his development at birth is only in its beginning stage. To be able to guide and foster his future development, we must know just where the new born infant is in his journey towards maturity.

The following factors have been found, to date, to have the most influence:

1. *Food*

The growth of foetus is very rapid during the later part of pregnancy and the mother's food is most important at this time and according to psychologists food should be selected to fill the requirements of foetus. The foetus needs proteins and carbohydrates for strength and energy. When the mother is seriously malnourished, the foetus does not receive from the maternal blood stream the needed elements of nourishments, pre-natal growth is hindered.

2. *Maternal Health*

Any diseased condition of the mother that affects her general metabolism will influence to a certain extent the development of the foetus. The diseases believed to be more serious are:

- (a) Syphilis.
- (b) Gonorrhea,
- (c) Endocrine disorders,
- (d) Tuberculosis, and
- (e) Diabetes.

3. *Emotional Experiences of Mother*

If the pre-natal period is predominantly a happy one for the mother, the disposition of the baby will be made cheerful and happy. A pre-natal period on the other hand marked by emotional disturbances, fears and worries will, it is believed, result in a morbid, sad, introverted personality for the baby. According to Willin and Riley the mother who resents the coming of her baby, either because it will interfere with the pattern of her life or because of her economic situation, experiences continued emotional tension which affects the activity of the foetus and the later adjustment of the child to his post-natal environment.

B. Neo-natal Stage

This period is the first two weeks of post-natal existence and is characterised by:

- (a) visual sensitivity,
- (b) respiratory and circulatory changes,
- (c) lid reflexes,
- (d) thermal sensitivity,
- (e) alteration and cessation of sucking movements.

This stage is also characterised by taste and olfactory discriminations.

C. Infancy

Infancy refers technically to the first two years of life. These two years of life are of tremendous importance in the progress of the individual. It is at this time that adjustment to the totally new environment outside the mother's body is being made and thus the infant learns to be self-dependent.

Generally speaking infancy period is described as spatial and social orientations. Sense organ movements are an integral part of the spatial orientations of the child and play an important role in attention and preceptual development. In this period child attains and maintains an erect posture which plays an important role in the spatial orientations of the child. Child also indulges in manipulatory activities like movement of arms, hands, fingers, lips, tongue, feet and toes. According to Gessel and Shirley,² in early infancy, locomotor activities are as follows:

1. Period of supine	29 weeks
2. Period of rolling	29 weeks
3. Pushing with knees or swimming	25 weeks
4. Scooting backwards	39 weeks
5. Creeping and walking	45 weeks
6. Independent walking	46 weeks.

According to Irwin and McCarthy, language development takes place at the following periods:

Babbling	2 months
Repetition of syllables	5 months
Conversation simple	11 months
1st word	5 months
37 words	2 years.

2. Gessel, A. and Shirley, *Child Development*, New York, Harper, 1949.

Thereafter length and complexity increases.

Emotional development proceeds from a differentiation of an initial excitement into 'distress', 'fear', 'anger', and 'delight', 'joy' and 'affection' by the age of two years.

D. Childhood

The childhood years include the years from age of two to puberty, though the entire period of immaturity from birth to maturity is often called childhood. Development at this stage is characterised by growth of control over the environment. The child who as a baby, learned to control his body, now seeks to gain control over his environment so that he can make himself a part of it. During this period the child learns to make social adjustments at this age. From approximately in the sixth year socialisation is of paramount importance. The name 'gang age' is sometimes given to this period because group activities of all sorts play an important role in the child's life.

E. Adolescence

The adolescent years extend from the onset of puberty, between the age of 11 and 13 in the average child, to the age of maturity, 21 years. The most important forms of development which occur are adjustment to the mature form of life, in which the child learns to be independent of adults and plans his life according to his own wishes. Generally speaking, adolescence may be looked upon as the last step in the long period of development which begins at the time of conception. By the end of adolescence, development has reached a point where the individual is legally and socially regarded as mature, and thus capable of living an independent life, free from supervision and guidance.

Principles of Child Development

The development of child integrates many points of view. It recognises the biological basis of behaviour—the constitutional factors—the chemistry of body—the nutritional condition—physical characteristics and effects of serious illness. It takes into account the interaction of these biological factors with the environment and the way the individual has learned to perceive himself and his environment.

Of all the environmental factors, the most influential are the interpersonal relations in the home, school and community. Social contacts are the biological necessity. The present and future build on the past, each competency gained paves the way for further progress. Many individuals tend to maintain throughout life a generally persistent and pervasive core of personality that is unique to each. For this reason, the development for

earliest years of the child's concepts of himself—how he views himself and how he feels about himself—is of crucial importance.

His learning takes place in a relationship. At the beginning of life, the child's relationship with his mother influences his learning. Gradually other relationship with father, mother and sister, grandparents and other people in the home are interwoven with the mother-child relationship. As the child grows older, relationships with other adults and children enter into his life. From the frank responses of their playmates children in later pre-school and early elementary school years learn how their behaviour affects other people and they modify it accordingly. During adolescence, chums may correct faults resulting from earlier childhood experiences. Adolescent years offer opportunities for sorting out childish ways of behaving and for forming new relationships.

Within the matrix of these personal relationships other factors are influencing the child's learning. Among these are his health and vitality, his urge to be active physically and mentally, and his curiosity. As soon as he acquires speech, the magic power of words, generalisations that guide learning and thoughts of the future give him a sense of direction and purpose. All these psychological forces interacting with environmental stimuli, enter into the learning sequence of drive-clue-response-gratification of reduction of tension. Each child has a pattern of growth unique to him. The concept of growth as a sequence of changes allows for wide individual difference within a culture and among cultures.

A few guidelines emerge quite clearly:

1. Infants and children need someone to love them. But love alone is not enough. Understanding and guidance is necessary.
2. Behaviour characteristic of a child and of a parent will change with advancing age of maturity. Children need different conditions at different stages of their development.
3. A child's behaviour should be interpreted in the light of his pattern of needs and experiences.
4. Growth is a process having its ups and downs and fluctuations.
5. To listen to children and learn from them is far better than to label them.

Palmer³ has listed the following principles of development:

3. Palmer, C.E., *The Development of Normal Children, Jr. of Speech Disorders*, Vol. V, pp. 185-188.

1. Behaviour patterns of children change with maturity.
2. Development occurs at different rates for different parts of the body.
3. Development progresses from the head downwards. For instance, in the infant, skin sensitivity comes in the uppermost part of the body before it appears in the lower.
4. Development proceeds from general to specific responses. For example, at first an infant shows his happiness by total bodily expression. When he grows older, he responds with a smile.
5. As the child grows, his expressional behaviour becomes more refined. At 17 months the child may throw a temper tantrum when another child takes his toy. When he is 4 years old, he will probably call the other child names.
6. Each development stage has certain traits characteristic of it.
7. Every child normally passes through each of several major stages of development.
8. Most traits are correlated in development. The child whose intellectual development is above average is generally above average in health, size, sociability and special attitudes.
9. The child develops as a unified whole. His intellect is related to his physical well-being; his physical health is affected by his emotions; his emotions are influenced by successes or failures in school.
10. Both the rate and pattern of the growth of the child can be modified by forces within and without the body.
11. Child growth is both quantitative and qualitative. The baby's digestive tract is an illustration of this principle. Growth in size permits a large intake at a single feeding. Changes in structure permit the digestion of more complex foods and increase the efficiency in converting foods into simpler forms which the body can use.
12. Child growth follows an orderly sequence. For the great mass of children, learning pattern, for example, follows each other in a fixed order. A child learns to stand before he walks and he passes through the babble stage of syllables in language before he speaks clearly.
13. Child growth is a continuous process.

14. There are periods of accelerated growth, periods of decelerated growth. During infancy and the early pre-school years growth moves rapidly, his physical health is affected by his emotions; his emotions are influenced by success or failure in school, and the maturity indications of each of the various aspects of growth appear in swift successions. During the school years the growth rate decreases although significant changes are taking place.
15. Growth patterns are not uniform from child to child.

Maturation and Learning: Basic Processes in Development

With reasonably adequate nutrition and care the infant grows in height and weight until he reaches a mature level of physical development. This type of growth is apparent to almost everybody. The mother says, "My boy is growing so fast that I can hardly keep him in clothing." Schools make provisions for this growth process by graduating the size of seats as children increase in age. There is, however, another general type of maturing that occurs simultaneously with physical growth which is not so readily observable. This growth process affects the infant's and child's behaviour in a more direct way than any other developmental function. With advancing age during infancy and childhood there is a corresponding increase in the gross magnitude and organisational complexity of the central nervous system. Microscopic study of the brains of deceased infants of different ages demonstrates the growth changes that have taken place in the central nervous system.

The maturation of neural tissues sets certain limits for children's behaviour. No amount of parental effort is sufficient to enable the three-month-old infant to talk in sentences. Neural development is too limited at this age for such complex behaviour. It is extremely important in the rearing and education of children to know what these maturational limits are for many different kinds of behaviour. Knowledge of these maturational limits by parents and teachers makes it possible for them to provide the most appropriate learning situations for children—situations that are neither too difficult nor too easy.

It should be noted that maturation of neural tissues is a necessary but not a sufficient condition for the appearance of certain types of behaviour. Between two and three years of age the child who grows up in a more or less normal environment usually learns to talk in short sentences. The maturation of the central nervous system plus numerous language experiences make this behaviour possible. If the child is deprived of a language environment this behaviour will not appear. For example, the congenitally deaf or near deaf child will not learn to talk until certain steps are taken to

provide him a language environment through amplified speech sounds or tactual stimuli.

What is Maturation?

Maturation, as a scientific concept, has been used for many years by geneticists to designate that period of development during which a germ cell becomes mature, a period in which the chromosomes of the immature germ cell are decreased in number by one-half. The term was borrowed and made popular in child psychology largely through the efforts of Gesell,⁴ who wrote in an early publication, "Growth is a process so intricate and so sensitive that there must be powerful stabilizing factors, intrinsic rather than extrinsic, which preserve the balance of the total pattern and the direction of the growth trend. Maturation is, in a sense, a name for this regulatory mechanism." One year later the concept was more specifically defined by Marquis⁵ who stated, "Maturation...is a modification of the organismic pattern in response to stimuli present in the inter-cellular and intra-cellular environments, which at the given moment are independent of external influences". At a later date McGoeth⁶ defined the concept in terms of behaviour change: "Maturation includes any change with age in the conditions of learning which depends primarily upon organic growth factors rather than upon prior practice or experience."

These definitions stress different aspects of the maturational process, but are essentially similar in their emphasis on organically internal processes that are more or less independent of those environmental factors external to the organism. It is doubtful that a clear-cut differentiation can be made between maturation and learning as they influence behaviour in many situations. However, despite this unavoidable overlapping, the concept of maturation appears to be an important one in that it can be used to designate certain variables influencing psychological development over which man has little or no control at the present time.

What is Learning?

The nature and conditions of learning are discussed at some length in Chapter 4 of this book; the concept is briefly defined at this point to help make the discussion more meaningful to the reader. Maturation emphasises the influence of variables that are internal to the organism, while learning is more concerned with environmental conditions external to the organism. Learning has been defined by McGoeth⁷ as "a change in performance as a function of practice. In most cases, if not in all this change has a

4. Gesell, A., *A Handbook of Child Psychology*.

5. Marquis, D.C., *The Criterion of Inmate Behaviour*.

6. McGoeth, J.A., *The Psychology of Human Learning*, Longmans, 1942.

7. *ibid.*

direction which satisfies the current motivating conditions of the individual." It can be seen from this definition that learning is highly related to maturation and the previous experiences of the individual. Maturation and experience set the limits of the individual's behaviour repertoire and determine the motivating conditions. However, the external environment causes the individual's behaviour to be modified until the current motivating conditions are satisfied. When the external environment remains fairly constant the organism's behaviour may become stereo-typed in certain situations: these somewhat inflexible modes of response have been called habits.

Marquis⁸ has defined learning in the following way, "It represents a modification of the organismic pattern in response to specific stimuli present in the external environment at the time of the modification."

In simplification, maturation may influence the individual's behaviour during dormant periods, while learning modifies the organism's behaviour only during periods in which there is response to the external environment. Learning does not occur unless the organism is active in a behavioural sense.

The Interaction of Maturation and Learning

Maturation and learning are so inextricably interwoven in the growth process that it is scientifically futile to attempt complete separation. There is no doubt that both processes are vital in the normal psychological development of man. Consider the vegetative idiot whose neural maturation is arrested at a very low level—no amount of environmental stimulation is sufficient to bring his behaviour into the normal range. Likewise, consider the child with average maturational development who has been deprived of normal environmental experience his behaviour is more infantile and less complex than would otherwise be the case.

It seems probable that the emergence of some behaviour patterns is more heavily influenced by maturation, while the emergence of others is more dependent on learning. In 1947 Carmichael⁹ who conducted extensive research on the maturation-learning problem, wrote, "Today it is becoming more and more clear that during the whole period of growth and even during maturity, and again especially in the decline of capacity in old age, the behaviour of an organism can always be seen as resulting from the changes of structure and function." Carmichael goes on to elaborate that these changes are practically the result of inherited patterns and that some responses appear to be somewhat independent of learning and environmental experience. The behaviour of the total foetal

8. Marquis, op. cit.

9. Carmichael, L., *Manual of Child*.

guinea pig appears to be purposive and end-seeking, yet there is no evidence that any of this behaviour is learned.

Gesell¹⁰ has adopted the point of view that the child's behaviour is influenced much less by "acculturation than by normal maturational" processes, processes which determine in such large measure the form and the sequence of infant behaviour pattern, that the infant as an individual is reasonably secure against extreme conditioning, whether favourable or unfavourable." As a result of their maturational inclination Gesell and his associates have attempted to identify those changes in behaviour that appear as a result of normal growth, independent of environmental conditions.

Methods of Child Psychology

In the history of scientific psychology, many different research techniques have been devised to study the multiform behaviour of animals and man. Technical procedures have been developed to study sensation and perception, learning, intellectual, social and emotional behaviour. Child psychology has borrowed liberally from these scientific methods, and has devised other methods especially appropriate to the study of children.

A knowledge of the advantages and limitations of the various research methods is important not only to the research worker but also to any serious student of this discipline. Some of the research findings in child psychology are in essential disagreement; hence it is necessary to examine the particular experimental methods used to collect the data in each study in order to determine which findings can be accepted with the highest degree of confidence.

All of the several research methods discussed below have been found useful in the study of children's behaviour and development. Each of the methods has certain advantages and limitations. Seldom is any of these methods used in isolation from all of the other methods, since it has been generally found that many different approaches to a psychological problem provide the most useful and meaningful results.

The child's behaviour and psychological development provide the basic phenomena observed and studied by child psychologists. This behaviour, including speech as well as other overt responses, may be studied in an environmental setting especially prepared to elicit a certain type of behaviour, or it may be recorded as the child reacts to a very restricted number of stimuli in a laboratory situation.

Behaviour of children may also be studied by various indirect methods. Children's past behaviour may be inferred by various historical methods, such as by studying children's drawings, literary

10. Gesell, op. cit.

or handicraft products, asking adults to recall events of their childhood, or asking adults to recall events that have taken place in the lives of children they know.

The Normative Approach

Maturation is relatively independent of environmental stimulation, and is a very important variable in child psychology. The developing child is not only learning from, and adapting to his environment, but is also changing psychologically and neurologically as an organism. It is frequently difficult to determine whether a certain change in behaviour is generated principally by maturational processes or by adaptation to environmental impacts. Some of these problems in the nature-nurture matrix have stimulated the collection of normative data—to answer the question of what behaviour can be normally expected to appear in children in various chronological age levels. Normative data in child psychology provide basis for practical applications in education and training, as well as supplying a background, or frame of reference, for the study and interpretation of children's behaviour and psychological development.

Cross-sectional and Longitudinal Methods

There are two quite different approaches to the collection of normative data about children's behaviour and development—the cross-sectional and the longitudinal methods. In the cross-sectional approach different groups of subjects at different stages of development are studied simultaneously. The approach has been most widely used because the experimenter can, within a short period of time, study the behaviour that is typical of children at many different stages of development. In the longitudinal approach, data are obtained by studying the same children over a period of years in their different stages of development. This method has been gaining in favour as shown by the large-scale longitudinal studies carried out in recent years at Harvard University and the University of California. The longitudinal is a more difficult method to employ because the experimenter must wait several years for the developmental span of childhood to elapse, and during this time children may leave the community where the research is being conducted. Some of the advantages of the longitudinal approach are readily apparent.

Anecdotal Method

This research method is primitive and crude, but has played an important role in almost all beginning sciences. The data obtained by this approach in child psychology have been typically based on incidental observations. From these incidental observations certain conceptions and generalisations about children's behaviour have been developed. Fortunately, as the science grows these first

approximations to general principles are further explored and tested by more objective scientific methods. Incidental observations are important in science since they frequently provide hunches and hypotheses that stimulate further study and research.

The stories of children being nurtured by wolves and other wild animals are based on evidence obtained by the anecdotal method. Diaries, newspaper reports and legends perpetuate the layman's belief in wolf-children.

Biographical Method

As previously noted, the biography has served a singularly important function in the development of experimental child psychology. It constitutes an advance over the anecdotal method in that it provides more systematic and extended study of the child. The biographer, often a parent, observes and records the behaviour of infants and young children, as development occurs. The modern "baby diary" illustrates a simplified version of the biography. In the baby diary, the observer—usually the infant's mother—records such elementary data as the day on which the baby sat alone for the first time, when he spoke his first word, and so forth.

The biographical research method has the advantage of providing continuous and more or less integrated observations of child development, but to offset this advantage are a series of limitations to its usefulness as a scientific instrument. One of its most serious limitations is the inordinate amount of time which the experimenter must devote to observation and recording. Because of this heavy time expenditure, many of the biographies have been written by parents or relatives who ordinarily spent a large amount of time with the observed children anyway. It seems doubtful that many parents can record the behaviour of their children from a cold, objective point of view, since common observation demonstrates them to be more prone to anticipate the first word, sentence or social smile of their infants than an impersonal outsider. Furthermore, parents who write biographies of their children's developing behaviour are highly selected with respect to socio-economic status, educational background and many other factors that are positively related to precocity in children's psychological development. This makes the "norms" of behaviour and development based on biographies inappropriate for use with an unselected population of children. Another limitation of the biographical methods is the biased interest of the observer. Since it is impossible to record all of the behaviour of a child, an observer may record only those aspects of the child's behaviour which interest him—furthermore the observer's interests may change considerably before the biography is completed.

Lest this method be judged too harshly, it should be noted that when the biographical method is used in conjunction with tests and

simple experimentation, it provides relevant and important data about children. A recent report by Valentine¹¹ presents data obtained by this combination of methods. However, even this approach has some of the serious limitations previously mentioned. If biographical data are to be accepted in the science of child psychology, it seems necessary that such data be collected by observers who are as unbiased as possible, and the conclusions drawn be subsequently tested by more objective scientific procedures.

Case History Method

The case history in child psychology was not originally developed as a scientific tool, rather, it was devised so that scientific principles could be more adequately applied to the care and training of an individual child. The case history is typically prepared for the child who is having trouble in adjusting to the stress of the environment in which he lives. It involves an attempt to collate all of the relevant facts about the child and his environment, so that these facts may be seen in perspective and proper insights may be obtained as to how the child may be helped to adjust to society.

Data for the case study of a child are obtained from as many sources as possible. Interviews are held with the child, his parents, neighbours, relatives, teachers, physician, or any other person who may shed some light on the child's problem. An attempt is made to obtain as much information as possible about the child's previous development and the types of environment in which he has lived. Psychological tests are used to ascertain his present intellectual and personality status. Every effort is expended to uncover all relevant data about the child and his environment. The case history has in this form great value for the practical handling of psychologically maladjusted children.

As a scientific method the case history can be accepted only with reservations. It is used to reconstruct the history of something that has previously happened; as a result the casual relations deduced from the case history are perforce *ad hoc* and not subjects to experimental verification. The subjects of any study based on clinical case histories are typical since they are drawn from a population of children who have not solved certain psychological problems satisfactorily. Hence, data collected from such subjects cannot be considered representative of the population as a whole. There are several scientific hazards in drawing conclusions from data based on psychological events that have already occurred. Mere concomitance of environmental impacts and behaviour aberrations is not sufficient to establish the presence of casual relationships. Even though recommendations based on certain generalizations from case history material may be of great value and clear up a

11. Valentine, C.W., *The Psychology of Early Childhood*, Cleveland Sherwood Press 1942.

child's problem of adjustment, one cannot relax on pragmatic grounds and assume that these generalizations are sound. Other recommendations based on different generalizations might be just as satisfactory, or the child might have adjusted by himself if no recommendations had been made. These are only a few of the logical and scientific snares encountered in an employment of case history materials for scientific purposes.¹²

Controlled Observation

Two rather different types of controlled observation are commonly employed for research purposes. The first method involves the observation of children's behaviour in environmental situations natural to their normal activities. The observer, when employing this research method, makes no attempt to control the child's environment, although he does predetermine the types of behaviour that are to be recorded. Unlike the biographer, who may attempt to observe and record all of the child's behaviour, an individual employing the controlled observational approach selects only small segments of the child's behaviour for systematic study.

The experimenter may have as his purpose the observation of only one type of behaviour, and thus be enforced to wait until this particular kind of behaviour situation occurs. This approach to such behaviour situations as children's quarrels and children's questions has been quite fruitful. The observer may also take small samples of the behaviour of children on several occasions, recording the presence, absence, or degree of certain types of behaviour during the sampling periods. Use of the controlled observation method in this form is illustrated in Parten's studies¹³ of social participation. In this research study pre-school children were observed in a free play situation. Each child was observed during sixty-one minute samplings. During each one-minute interval the observer rated on a predetermined scale the degree of leadership and social participation exhibited by a given child. By correlating the sums of the ratings on the odd and the even days for all of the children, it was possible to determine the reliability of the instrument.

The second type of controlled observation is illustrated in Jack's study¹⁴ of the ascendant behaviour of pre-school children. In this experiment successive pairs of children were placed in a small room containing a sand table and a limited number of toys. Through a one-way-vision screen the ascendant behaviour of the children in their efforts to obtain the most desirable toys and to direct each other's behaviour was observed and recorded by the experimenter.

12. Thompson, *Child Psychology*, H.M. Company, New York, 1952, p. 22.

13. Third, p. 24.

14. Jack, L.M., *An Experimental Study of Adolescent Behaviour*, Child Welfare 1952.

The placement of children in a situation where there are a limited number of controlled environmental stimuli to which the children can respond is the major criterion of this type of controlled observation procedure.

Questionnaires

The questionnaire method was developed as a research instrument in America by G. Stanley Hall and his students. Although this research instrument has unquestionably provided useful information about children's behaviour in some instances, it has been widely criticised as a research method. Such criticism has in most cases been advanced with ample justification. The questionnaire has probably been used more frequently by untrained research workers than any other research procedure because of its apparent simplicity—some of the findings derived from these abortive research endeavours have, indeed, been incoherent.¹⁵ Some of the more competent scholars have amply demonstrated that this method can provide reliable and valid information when it is used skilfully in appropriate research problems. However, it should be noted that this instrument has been misapplied so frequently as to cause the average psychologist to raise an eyebrow in skepticism until he has rather thoroughly investigated both the nature of a particular questionnaire's construction and the characteristics of the respondent employed. Perhaps, as suggested above, this instrument for research has been mishandled so frequently because it appears on the surface to be such a simple method—just questions and answers. This appearance of simplicity is deceptive—such is not the case.

Two quite different types of questionnaires have been used in research work with children. The first type—generally discredited as a useful scientific tool by child psychologists—solicits the opinions and attitudes of a select group of respondents on some problem such as the relative value of educational practices "A" and "B". This type of questionnaire may include a series of questions similar to the following:

Do you think that the reading of comic books cause juvenile delinquency? Yes.....No.....Don't know.....Comments.....

Does the reading of comic books increase children's reading ability? Yes.....No.....Don't know.....Comments.....

Data collected with this type of questionnaire are useful in direct proportion to the insightfulness and skill of the respondents. One might comment that the information provided by such a technique

15. Thompson, *op. cit.*

may very frequently constitute a careful collection of ignorance.

The other type of questionnaire solicits facts that the respondents are able to list either on the basis of recent observations or on the basis of permanent records available to and used by them at the time the questionnaire is answered. An instrument of this second type might include questions similar to the following:

Age of your son.....Grade in school.....How much money did your son spend on comic books during the last week?.....During the last month?.....

How many library books (school or public) did your son bring home during the last week?.....During the last month?.....

The validity of the data collected by this type of instrument depends primarily on the care with which the questions are phrased by the experimenter and the competence and cooperation of the respondents. When the questions are specific and carefully phrased in an attempt to avoid ambiguities and misunderstandings, information collected in this manner may have a reasonably high degree of reliability and validity. However, even under the best of circumstances, the questionnaire method is subject to errors due to forgetting, misunderstanding and carelessness on the part of the respondents. This technique has proved most useful in child psychology as an exploratory instrument—it has been used to good advantage in preliminary studies of children's friendships, radio listening habits, play interests.¹⁶

Ratings

This research method consists of relatively crude scaling procedures that have proved useful when more precise tests or instruments for measurement are not available. For example, many of the quite complete aspects of children's personalities are as yet inaccessible to either direct or indirect measurement by psychological tests. With the aid of rating scales some of these complex components of child behaviour can be quantified in a rough, rule-of-thumb manner—crude measurement is usually considered superior to a complete lack of knowledge.¹⁷

The ranking procedure is the least complicated of the rating methods. This is a scaling device that almost every one has used to make comparisons during everyday affairs. When employing this procedure in child psychology, an experimenter might observe several children for a period of several days and then assign to these children rank-order positions (first, second, third, etc.) with respect to such a personality trait as 'kindness'. Since no standardized test to measure kindness is available, these approximate rank-order

16. Thompson, *Child Psychology*, H.M. Company, New York, pp. 30-35.

17. *ibid.*

data might be more useful than casual observations—indeed, these rankings might be used to validate a scale constructed to measure such an attribute as kindness.

The rating procedure involves an observer's indicating where he believes a child stands on a continuum with respect to some characteristic, trait or type of behaviour. The rating is frequently made on a linear, graphic scale similar to the following :

x						
1	2	3	4	5	6	7
very submissive			average			very aggressive

In this example the observer has indicated that he believes the child who has been rated is slightly below average in aggressiveness. When this rating method is employed by an observer to rate children on a series of psychological traits or characteristics, the trained rater exercises extreme precautions to avoid "halo" effects. These halo effects consist of rating a child high, or low on certain traits.

Rating scales, although crude instruments, provide useful information about children's behaviour and psychological development.

It can readily be seen that both the ranking and rating procedures have definite limitations as research instrument. On the most serious limitations is the effect of the observer's prejudices and biases on the ratings—subtle components difficult to eliminate. An observer may also know some children better than others, hence some of his ratings may be more useful than others.

Since the data obtained from the use of rating scales give an impression of great precision because of the numerical values assigned and the statistical analysis made possible, the experienced researched worker is careful not to place more confidence in this type of data as a mathematical wag has noted, "Figures sometimes fool."

Psychological Tests

As stated previously, it is desirable to measure as accurately as possible the many aspects of children's behaviour and development. Standardized tests have been constructed for this purpose. These tests are standardized in the sense that they are administered under controlled conditions and in the sense that it is usually known how a representative body of children respond to the tests; this latter type of knowledge provides "norms" for evaluating an individual child's performance with respect to the general population of children of his age, sex, etc.

Some of the available tests are relatively simple in nature, such as techniques for measuring the speed of tapping and speed of reaction time. Such tests are relatively straightforward because they depend upon instruments already highly developed in the physical sciences; it is also true that psychophysical relationships constitute one of the oldest areas of psychological investigation. When tests of this type are employed in psychological research, the experimenter usually has little doubt about their validity; furthermore, the reliability of data obtained with such simple instruments can be satisfactorily established in most instances without undue labour.

When a research worker uses one of the more complex and indirect scales, such as tests of intelligence, personality and social maturity, his confidence in the validity of these instruments may not be high. It is sometimes difficult to establish the validity of such complex scales beyond a "reasonable scientific doubt." In developing scales for the measurement of the more complex aspects of psychological behaviour and development, the psychologist usually prepares a large number of questions or tasks which are related in his opinion to the complex behaviour to be measured. These test items or tasks are then administered to a large group of children. On the basis of intercorrelations among these test items an attempt is made to select for the final scale only those items that measure pretty much the same thing. When a fairly large group of interrelated test items is secured, a preliminary test form of this complex type of behaviour is available for further refinement. The next task confronting the experimenter is a demonstration that this newly devised test measures reliably what it purports to measure (reliability and validity). Also, it must be demonstrated that the scale is useful, i.e., that the test results are functionally related to similar aspects of children's behaviour and development. Intelligence tests have proved useful, because they help to predict such important aspects of behaviour as academic success, success on the job, etc.

Psychological tests provide useful information for practical applications in child guidance and extremely useful data to research workers who seek further knowledge of the inter-relationships in children's behaviour and the influence of various environmental conditions on children's psychological growth. There is a continuous search among child psychologists for additional scales to measure the multiple aspects of children's behaviour. Furthermore, psychologists are alert for procedures that might improve the validity and reliability of the available tests.

Tests for the measurement of intelligence are the most highly refined of the existing psychological scales designed to measure the more complex aspects of behaviour and development. Among the tests constructed to measure some of the other complex components of child behaviour are individual and group tests of motor, language, social, emotional and personality development.

Experimental Methods

The experimental method has been used in a large number of investigations of children's behaviour and psychological development. It has been employed in research aimed at establishing conditioned responses in infants, in research conducted to study the effects of different social incentives on children's behaviour. A definitive line between the controlled observation and the experimental methods cannot be drawn, for one method shades into the other in certain research studies. Perhaps the most distinguishing characteristic of the experimental method consists of the active part taken by the experimenter to control the environmental situation to which the children are exposed. This more precise control makes it possible to describe the environmental variables with a higher degree of confidence than is usually possible when the controlled observation method is used. The more detailed and exact description of environmental factors made possible by use of the experimental method makes it more feasible for other investigators to repeat an experiment in their own laboratories.

Many of the research studies in child psychology that have been conducted with the experimental method have been directed toward a determination of the changes in children's behaviour and development that can be expected when known environmental variables are systematically varied. Such investigations are very frequently carried out with control groups, matched pairs of children, or identical twins.

The experimental method has been attacked by some critics on the ground that it sets up an 'artificial situation'. Such critics usually urge the collection of psychological data in 'life-like' situations. In defence of this research procedure it might be noted that this same criticism of 'artificiality' could have been applied just as appropriately to laboratory studies in physics during the beginning stages of its scientific development. It is exceedingly difficult to investigate thoroughly and effectively the many aspects of natural phenomena unless the observer can obtain some degree of control over the most relevant variables and can study what occurs when these variables are applied in various combinations. This control also permits the repetition of a research study—a very important contribution to scientific knowledge.

Child behaviour and psychological development appear far too complex for man with his limited intellectual facilities to study as unanalyzed units. To be sure, it is most desirable to understand the behaviour of the 'whole child, but such understanding will probably come only by analyzing and interrelating certain limited components of the child's behaviour. Before the advent of experimental methodology in child psychology man had been observing the 'whole' child for centuries; history bears witness to the paucity of information that accrued from this approach. On the basis of

less than fifty years of experimentation it would appear that the application of experimental methods—which do no physical or psychological harm to children—can do much to increase man's knowledge of children's behaviour and psychological development.

In the experimental method, the behaviour of children is carefully recorded and analyzed in the psychological laboratory or in any other situation in which it is possible to control the major environmental variables. Although it is usually impossible to control all of the relevant variables in an environmental situation, the use of the control groups of various types and of the employment of certain statistical procedures in the analysis of the data make it possible to study many of the complex aspects of child behaviour with a reasonable small amount of undetermined error.

Psychoanalytic Method

The psychoanalytic interview is usually conducted by physicians with a specialised training in some branch of psychoanalysis. This method was originally developed as a type of psychotherapy to be used with adults who were suffering from troublesome psychological conflicts in their personal life. During such interviews it was found that adults very frequently recall emotionally unpleasant experiences from their childhood days. Indeed, adult conflicts laid bare by this therapeutic procedure have been traced in most cases to psychological conflicts occurring in childhood and carried over into adult life. Some of the psychoanalytic reports indicate that certain adults during this type of psychotherapy have been able to recall childhood experiences occurring during the first year of life. It can be seen that data obtained by this method are extremely difficult to validate in the useful scientific sense. Moreover, the method has serious limitations when applied directly with young children because of its extreme recourse to verbalization.

To circumvent the difficulties inherent in the highly verbalized nature of psychoanalysis a number of projective techniques (doll play and other relatively unstructured environmental settings) have been developed to study the personality characteristics of children. The modern projective methods which stem indirectly from psychoanalytic concepts have been generally accepted as research instruments in child psychology and promise rich contributions to our understanding of children's conflicts, feelings of aggression and psychological problems.

The projective techniques are based on the thesis that children reveal their desires, interests, attitude, aggressions, aversions, and emotional conflicts most clearly when they are involved in free-expression activities. The covert impulses and conflicts may be uncovered through various expressive media: doll play, finger-painting, inkblots, sculpture, vaguely defined photographs, oral and

written dramatizations. Many of the expressive types of behaviour which may appear haphazard and meaningless to an untrained observer are analyzed and interpreted by trained experimenters as significant indications of deepseated desires and frustrations. The projective methods are difficult to evaluate unequivocally at the present time because of the difficult problem of establishing their reliability and validity. However, progress is being made toward a solution of these methodological difficulties, and this somewhat novel approach shows extreme promise.

Miscellaneous Methods

There are other specialized methods of collecting and analyzing children's behaviour and psychological growth; psychophysical methods, psychological interviews, introspective accounts, hypnosis, community surveys, statistics, factor analysis. Some of these methods overlap the research approaches described previously in this chapter, while others such as statistics and factor analysis are too complex and are rarely used.

Multiple Approaches

The research methods, briefly presented in this chapter, include the major experimental approaches to children's behaviour and growth. It should be noted, however, that a comprehensive investigation typically involves the use of several of these scientific procedures. For example, the experimental method might be employed, psychological tests used to equate the experimental groups, controlled observations taken to describe the behaviour of the children during the course of the study, ratings made of changes in general behaviour, questionnaires circulated among the children's parents to study the efforts of the experiment on the children's behaviour in the home, interviews conducted with the children to determine their reactions to certain parts of the experiments, and statistics used to determine the reliability of the differences between the experimental and control groups at the cost of the experiment.¹⁸

18. *ibid*, p. 4.

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HEREDITY AND ENVIRONMENT

HEREDITY and environment question (also named nature and nurture by Francis Galton) has been under scientific investigation since the year 1860. This subject has been discussed with much emotion in educational psychology. There has been a tendency on the part of a few psychologists to behave in an extreme partisanship either towards heredity or towards environment.

1. The Mechanism of Heredity

Germ Cells

The heredity of physical and anatomical characteristics has been well established. Like begets like. The transmission of characteristics from one generation to another takes place by means of germ-cells of the parents. In the nucleus of the germ-cells, life chromosomes are the material basis of heredity. The chromosome is said to consist of genes which is not visible under the microscope. It has been said that they are usually arranged in the chromosomes in pairs in long strings. Many of these pairs are necessary to produce even the simplest physical characteristics of the animal. Unit characters are produced by various combinations of genes.

Modern science on genetics has thrown some light on the nature of heredity. Behaviour genetics have been investigated elaborately. It is observed that in modern genetics, science of heredity shows how physical characters of offsprings are derived from the characteristics of parents. Behaviour genetics concern itself with the inheritance of behaviour rather than of physical structure. According to the latest information available on genetics¹ which is reproduced below, an individual's heredity consists of specific genes which he receives from each parent at conception. Heredity implies,

1. This information is based on studies like:

- (1) *The Principles of Heredity* by Synder, L.H., 5th Ed., Heath, 1957.
- (2) *Studies in Child Development* by Gessell, A., Harper, 1948.
- (3) *Human Genetics* by Gates, R.R., Macmillan, 1946.

in the technical sense, the biological heredity. According to the present evidence, an individual's heredity is determined by the specific genes received by him from each parent at the time of conception. (see Fig. 1)

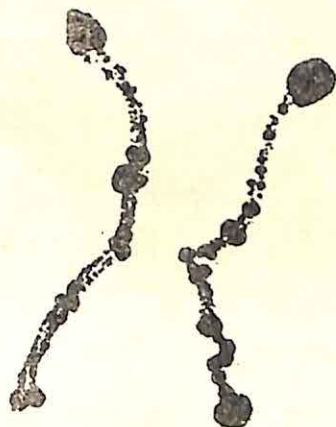


FIGURE 1

Chromosomes in Elongated Threadlike Form Showing Genes arranged in Linear order from L.P. Thorpe, *Child Psychology and Development*. Copyright, 1946, by the Ronald Press Company.

To understand the mechanism of heredity, the concepts of phenotypes and genotypes have been introduced. Phenotypes explain the actual individual as we can understand him, such as, a person who can see the colour normally. Genotypes explain the nature of the carrier or genetic qualities that may or may not be manifested by him, such as, a mother who may transmit colour blindness to her sons. For the understanding of the heredity unit of the chromosomes and genes, individual genotypes have to be understood. The genes, determinant of individuality, are grouped into chromosomes. These are coloured bodies. They become visible within the nucleus cell when the cell is stained with certain dyes for observation. It has now been observed that chromosomes occur in pairs, the two members of each pair being similar in appearance and functions. The number of chromosomes in each cell is, in general, constant within each species but differ from one species to another. (see Fig. 2)

Each human cell, contains 46 chromosomes, 23 from the father and 23 from the mother. The recent researches have led us to believe that the correct number of human chromosomes is 46 and 48 as thought out previously. Chromosomes are visible under the microscope appearing as rod-like or V-shaped bodies. The genes with each chromosome, however, are so minute that it becomes sometimes difficult to see these with the high-powered microscope. At the time of conception every individual begins life as a single cell.



FIGURE 2
Chromosomes in pairs

The determination of the traits in the individual is caused by the pairing of genes. If both members of a gene pair are dominant, the individual will show the trait determined by the gene. If one is the dominant and the other is recessive, the individual will show the trait of the dominant gene, but he will also carry the recessive genes which may show up in trait in his offspring. A recessive trait manifests only if both genes are recessive. Thus it is seen that an important attribute of the gene is dominant or recessive. Dominant and recessive genes determine the characteristics in an individual. In the dominant-recessive trait, the heterozygote is, of course, to be distinguished from the homozygotes. The study of heterozygotes and homozygotes and their conditions have proved useful information regarding the hereditary qualities which the individual is in a position to transmit to his offspring. Sex chromosomes determine the sex of an individual. Every individual is believed to possess all the genes necessary for both sexes. It is only the combination that determines the sex and this determination of sex is due to chance factors.

In the human race, as well as in lower animals, the characteristics are determined by genetic combination. As is obvious, the simple human characteristics generally depend upon the combined influence of large number of genes.

Experiments by Mendel and Galton

In 1866, Mendel published the results of his experiments in the Hybridization of peas. Mendel showed difference between dominant and recessive traits. The dominant character, when present, always appears. The recessive character can appear only when the dominant is not present. The Mendelian Ratio (3 to 1) shows the expectation of the appearance of dominant and recessive character in the offspring of the second generation of two pure types. Only characteristics inherited by the parents are passed on to their offspring.

Characteristics acquired by the parents are not inherited by their children. This point has been discussed for a long time and the debate is still going on, but the evidence at present is against the possibility of the inheritance of acquired characteristics. Many of the physical characteristics of man are found to be inherited in the Mendelian fashion.

Francis Galton was the first person who stimulated interest in the inheritance of psychological traits. His first important contribution was 'Hereditary Genius' published in 1869. He studied the family histories of many eminent men and found that a certain trait or ability appeared frequently in a family. He concluded that this trait was inherited. This way he began the family history method for studying the question of inheritance. Francis Galton recognised for the first time the importance of the study of twins. He gathered data by means of the questionnaire. By showing the greater similarity of more closely related individuals and by studying large numbers Galton is said to have started the correlational method for the study of inheritance. These two methods are discussed below:

1. The Family History Method

The pioneer work here is Galton's family histories of eminent British men. In his study 'Wedgewood Darwin', Galton found family histories of eminent scientists and scientifically inclined individuals. Karl Pearson later extended this family tree, tracing it back many hundred years and found individuals of outstanding ability all along the line. Dugdale (1877) did pioneering work in the study of inheritance of inferior mentality. The Jukes family has become famous. In the Jukes family were found a number of prostitutes, criminals and paupers. The author comes to the conclusion that prostitution, criminality and pauperism are inherited traits.

This early work by Galton and Dugdale has stimulated a great many family history studies in recent times. Family showing feeble mindedness, superior mental ability, insanity and so on are considered as evidence for the inheritance of mental traits. Goddard's Kallikak family is one of the best known. Here, we have two collateral lines, one highly intelligent, the other feeble minded, both going back to the same progenitor at the time of the American Revolution. This man contracted two unions, one with a feeble woman from which feeble minded line descends and the other with an intelligent woman from which the superior individuals descend. Goddard has studied the family histories of 327 feeble minded individuals. He came to the conclusion that feeble mindedness is inherited in about 54 per cent of these families.

2. Correlational Method

With the help of correlational method we can find the correlation between measurements of mental traits of pairs of individuals

and we can thus compare the degree of similarity in the case of individuals of different degrees of relationship. It has been found that among chance pairs of unrelated individuals we find positive correlation increasing in size according to increase in degree of relationship between paired individuals. Galton maintained that mental traits were inherited in the same manner of degree as physical traits. Person found a correlation of about .5 between siblings for such physical traits as height, colour of eyes and hair. He also found a correlation of about .5 for such traits as vivacity, self-assertiveness, temper ability or the like. He came to the conclusion that environment has no influence upon the height or colour of the eyes of siblings and hence the degree of resemblance is caused by heredity. In mental traits also we find the degree of resemblance. This can be illustrated by correlational studies done at twins and siblings.

3. Twins

Twins are of two kinds: identical and fraternal. Identical twins are the result of the germination of one ovum. Fraternal twins arise from the germination of two separate ova. The study of twins, especially identical twins, is, therefore, of great interest for heredity. In identical twins we have the closest possible relationship between two individuals. Thorndike, Merriman, Wingfield, and others have conducted many studies on twins. The correlations between pairs for intelligence range from .62 to .92 and correlations for identical twins cluster around .90 and those for fraternal twins around .75.

The question arises what happens to identical twins, if they are separated at an early age and reared apart from each other for most of their lives. Newman and Muller have been gathering data about such cases. The results are as follows:

	Average I.Q. (Difference)
Identical twins reared together	5.3
Identical twins reared apart	7.7
Fraternal twins reared together	9.9
Re-tests of same individuals	6.8

It is seen from the above that identical twins which are reared apart differ somewhat more than identical twins reared together, but they still remain more alike than fraternal twins reared together. Evidently here the potency of heredity is much more.

4. Siblings

The relationship between siblings is not as close as that of twins. What is the correlation? Many psychologists found some correlations and they ranged from .27 to .68. They cluster round 50. Eartshorne and May find a similar correlation between the siblings

in tests of honesty. In physical characteristic also correlation is .50. Thus, we came to the conclusion that intelligence as well as physical characteristics are inherited. We summarise below the summary of correlated results:

Identical twins	.90
Fraternal twins	.75
Mid-Parent and Child	.60
Siblings	.60
Single Parent and Child	.45
Cousins	.25
Unrelated children	.00

Hence, the growth of the personality of a child is determined by two factors—heredity and environment. The child inherits his bodily form and certain mental qualities from his parents. Education is the process by which these inborn and inherited tendencies are so developed and modified that he learns to adapt himself to the environment in which he has to live.

Hereditary Endowment

1. Every man and every woman at conception receive 23 chromosomes from each parent or 46 in all.
2. In mating each passes one half of his or her chromosomes to every child.
3. The father's role is that of passing one half of his chromosomes by way of a sperm.
4. The mother although she acts as incubator and nourisher for the egg, contributes no more to the child's heredity than does the father.
5. These 46 chromosomes comprise everything that determines the heredity of the child.

Heredity means the sum total of all traits which are present at the time of birth. It means likeness. The offspring of man is man and of monkey is monkey. All resemblances such as height, pointed features and similarity are considered due to heredity. Heredity includes all likeness and dislikeness between parents and off-springs. Reflex action, instincts and emotions are all inborn tendencies. They form the bases of human personality. Heredity forms a foundation. The whole of later behaviour depends on heredity. The main law of heredity is like begets like. Cow gives birth to calves and human beings to human babies. Therefore, heredity is the sum total of all inborn individual traits. Heredity is the major factor, determining the development of the individual. Heredity puts the limits of growth and development. It is just like the raw material out of

which objects are prepared, moulding it and treating it with a special process, but retaining the basic properties.

What the individual is and what physical and mental traits he possesses are determined by the type of parents, grand-parents and other ancestors he had. What is transmitted from parents to offsprings is not the brain itself, but the gene which will determine the form that it will take in offsprings. To understand fully the role played by the gene in heredity, one must know what gene is, where it is located, and how it acts as transmitter of hereditary traits. According to Hurlock, man like all the higher animals starts life as a single cell. It is a fertilized ovum or egg cell which is technically known as zygote. The zygote is the most wonderful speck of matter in the whole universe for it contains potentially all the characters—mental, moral and physical that the adult human being will subsequently display. The zygote is formed by two cells—the male and the female.

The male generation cell is known as sperm or spermatozoon. The female cell is an egg which is known as ovum. The ovum is only $\frac{1}{25}$ of an inch in its diameter and the spermatozoon is about 3,00,000 times smaller than the ovum. The combination of these results into a fertilized egg or zygote. The sperm of every species of animal or plant carries a definite number of bodies called chromosomes. The egg also carries the same number. For human beings the number is twenty-three. Consequently, when the sperm unites with the egg, the fertilized egg will contain twenty-three pairs of chromosomes. Each chromosome bears a large number of genes. Genes are regarded as the carriers of heredity. So in one zygote, there can be thousands of possible combinations. On this combination of male and female genes depends the whole heredity. If the good genes from male combine with the good genes of the female, the offspring will be poor for particular traits. Thus the ultimate genes are the seats of heredity. When the two cells unite (also their genes) it is then and there determined whether this resultant will be male or female, tall or short, blue eyed, or short eyed, clever or stupid. Every trait that the individual will later exhibit is potentially present; in other words, his or her heredity is fixed and nothing can possibly be added to it. If anything is added to, after the egg is fertilized that is not considered as heredity. Heredity, therefore, can be defined as the sum total of traits potentially present in the fertilized ovum. (see Fig. 3).

The fertilized egg or the zygote divides into two cells. One is known as germ-cell and the other as body-cell. The experiments of Galton and Weismann showed that the germ-cell is reserved unchanged for the formation of germ-cells of the following generations. As a matter of fact, the sex cells which form the generations are separated from the rest of the body at a very early period of embryological development. The second part of egg zygote known

as body cell divides very quickly and differentiates to form the various parts of the body of the adult worm. This early segregation

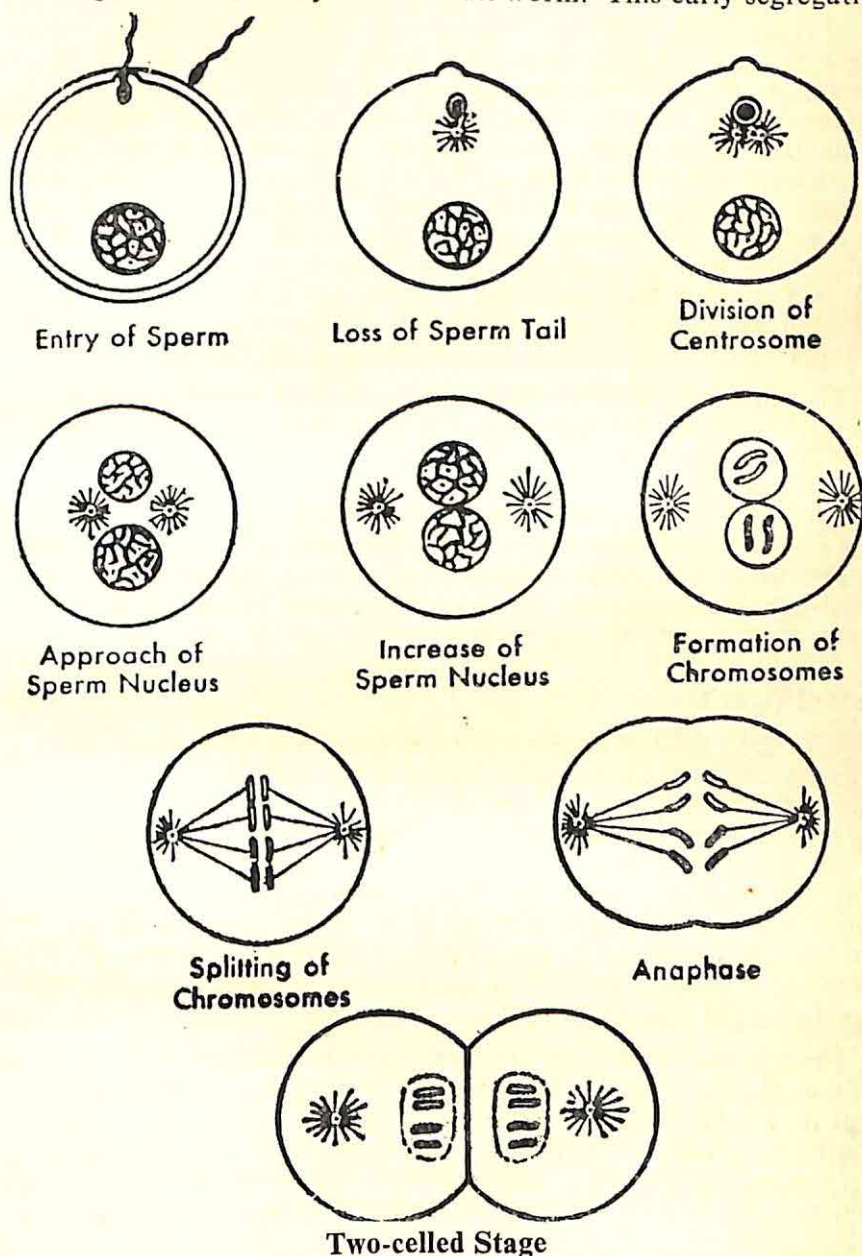


FIGURE 3

The Process of Fertilization

Paternal chromosomes are represented as black; maternal chromosomes as white

as been observed in many animals, and presumably holds true for man. The child is, therefore, as old as the parent.

It is extremely difficult, rather impossible, to control the human genes, though the investigators are doing research in this field. It is easy to do the experiment on plants and animals than on human beings. In plants the cotarists are quite successful in producing the better seeds. Every day we find that new seeds of cotton, wheat and others have a better yield and are also more useful. This is genetic field of research. Similarly, the breeder of animals gets better offspring from the selected parents. It may be pointed out that an intelligent parent may have dull genes also. A tall person may have genes for shortness. This is the reason why an intelligent person may give birth to a dull child or the tall parents may have a short son. There is a great variety of genes.

Heredity does not depend on the immediate parents but it goes very far. It may go upto animal level. According to Galton, if heredity is considered as a unity, i.e. one half ($\frac{1}{2}$) is due to immediate parents i.e. father and mother. One-fourth is due to grandparents i.e. parental grandfather and mother and maternal grandfather and mother. Similarly, one-eighth ($\frac{1}{8}$) of heredity depends on the father and mother of grandfathers and mothers. The same series goes on and its sum total is never equal to one or unity, and, therefore, heredity is very old.

Law of Inheritance

(a) Like tends to beget like; cats give birth to kittens, dogs to puppies, cows to calves and human beings to human babies. Further the kittens, puppies, calves and babies resemble their own particular parents rather than other species and their parents. Not only is this true in a general way but in every detail as well. Black-coloured parents generally have black children, tall parents tall children and dull parents dull children. That the clever children resemble their parents is due to the continuity of germ-cell. The germ-cell is handed over from generation to generation, the individual being the custodian of it.

Francis Galton and others made several statistical investigations on the inheritance. He studied the biographies of 977 fairly eminent men. He wanted to know whether 977 men under investigation had a greater or a smaller number of eminent relations than the general population. The result of his study showed that these men had relatives of the same or higher degree of eminence.

(b) *Law of Variation*: The second law of inheritance is law of variation. It is true that although like birds beget like, yet there are always variations. Common observation shows that although like birds beget like, yet the resemblance of parents and offspring are never perfect. Puppies are never exactly like their parents.

Sometimes the difference is more marked, as for example, when a bright child is born to short parents, black-eyed children to brown-eyed parents.

The cause of variation is still a mystery. There are two theories to explain it i.e., theory of Darwin and theory of Lamarck, but so far this is a controversial point and there is no final universal acceptance of the abovementioned theories. All that can be said about variation is that it is a fact of life that all living protoplasm has an inherent tendency to vary. Even the two twins are not exactly alike. Without variation in plant and animal kingdom, there could be no evolution.

Recent Researches

Recent advances in research on genetics have provided considerable light on the mechanisms of heredity. As already stated above, chromosomes form the genetic substance. It has been learnt that chromosomes, in germ-cells, have some contribution in providing limits to one's abilities and sets the seal of inheritance in a person. Researches in genetics have shown that 'gene' is the functional unit of heredity. It is very firmly asserted that chromosomes contain genes. Detailed studies of genes have revealed that they are formed of special compound of an acid called amino acid. Molecular biologists are engaged in continuous research in studying the mysteries of 'genes' which are called as the secret of life.

The development of personality in a person is as much determined by forces of change in the environment as it is determined by gene which lays the basis of foundation for the personality structure of a person. Combination of dominant and recessive genes provide tendencies in the individual towards behaviour characteristics. The specific characteristics, carried by the genes, have not been identified in the human species definitely although lot of research has been done in this field.

Eysenck has given genetic orientation to personality. His works in personality field is important. He has found and described three primary dimensions of personality:

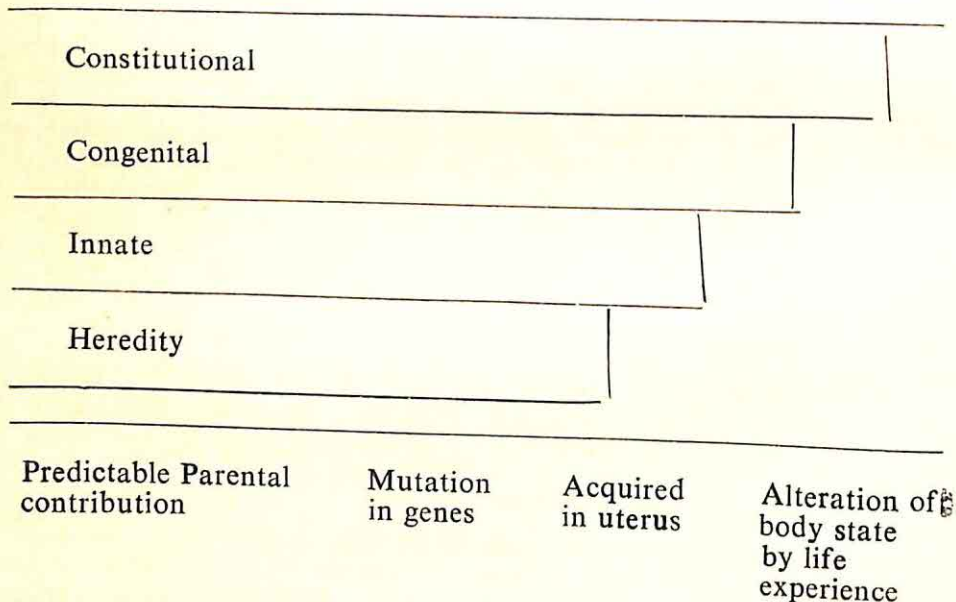
Introversion versus extroversion, normality (stability) versus neuroticism (instability) and psychoticism. His researches have led him to believe that personality is genetically caused. He traces neuroticism to the autonomic nervous system and extroversion-introversion to the central nervous system.

That genes determine the hereditary features of an individual has been made clear enough by many experiments with mutations and it has induced changes in specific genes. Mutation changes have been found to change not only the structure of organisms but also their metabolic activities. The demonstration of this relationship

between genes and metabolic activities has established that there is a close link between genes and enzymes. Genes may influence many hereditary characteristics by influencing enzyme systems. Although the relationship between genes and enzymes has been established, it has not yet been known for certain just what the link is between them.

Breakthrough in the researches on cytological genetics, including the work on the causes of cytological genetics and of mongolism, has thrown light on the working and nature of biochemical genetics. These studies have shown that there is a relationship between human genetics and intelligence. It has been observed, as stated above, that genes exert their influence on human behaviour through their effect at the molecular level of the organisation. It has been found that enzymes, hormones, and neurons could be responsible for sequence of path markers between the genes and intelligence behaviour.

It is important to make distinction with 'innate' and 'congenital' concept which are very often used while discussing heredity. Distinction between heredity and innate qualities has to be likewise clear. Cattell² has provided a diagram which tries to illustrate several commonly used terms in heredity. Cattell has commented that the haemophilia, which affected several descendants of Queen Victoria, was innate but not hereditary since it has apparently appeared as a mutation and not as inherited from her ancestors. Cattell gives the following diagram to illustrate the distinction:



2. Cf. Cattell (1965 a. p. 34.)'

Environment

In the above paragraphs, the viewpoint of genetics on the inheritance of traits in human beings has been given. It is worthwhile to present the viewpoint of environmentalists on the role of environment in personality.

Environment has a broad significance. It is a comprehensive term. It has a dynamic connotation. Environment means social, moral, economic, political, physical and intellectual factors which influence the development of the individual. Environment is the aggregate of the total forces and stimulations which the individual receives from the conception until death. Environment also includes pre-natal and post-natal environment. Food items, school, family and locality are also included in it. In short, environment affects the behaviour of the individuals. The question arises which is important. Heredity or Environment? There is no doubt that environmental factor also makes important contribution to the development of the personality of the child. It is generally believed that the intra-uterine fluid constitutes the suitable environment upon which the embryo draws in order to mature. The embryo or the foetus depends on the mother for its blood and oxygen supply as for the supply of hormones, vitamins and the materials which make for the nutrition and the healthy growth of the child. The cells of the embryo also develop by the influence of the surrounding cells and cell-tissues acting upon one another chemically or electrically. Each neighbouring cell acts upon another like an environmental force. Thirdly, whether exercise at the intra-uterine helps the development of the embryo is open to doubt. Again, it is also uncertain whether any definite learning takes place during the pre-natal period. According to some competent authorities on the problem, the conditions for a simple type of learning are present and some genuine learning takes place before birth.

Watson, the behaviourist psychologist, believed that environment was important for a person and not the heredity. He asserted that environment rather than heredity determines human behaviour. His assertion is that the effect of the environment is chiefly brought through a definite process which he called the conditioning reflexes. He carried his theory to the extent where heredity was allowed no significant weight in determining behaviour. Watson said that science, being a public process, must ignore private awareness and deal only with those data which are available everywhere. The influence of environment are more important in Watson's eye.

The quality of social environment, some authors think, therefore, determines the development in a person. If social environment is very stimulating and enriching, it will create favourable impressions in the person on his or her development and if this environment is dull or insipid, behaviour is likely to be shaped in a

unhealthy way. Absence of adequate stimulation in the environment is liable to cause various emotional deficiencies. Continued living in this environment may lead to various emotional problems and emotional instabilities. Emotional immaturity and various personality disorders may also ensue in a social environment threatened by insecurity.

According to this school of thought, the social environment of the person at various stages of life—infancy, childhood, adolescence and even adulthood, are formative in character as it influences the maturation process with which heredity is closely connected. The type and quality of influence that is prevailing in the environment will shape the mind of the person. Social environment refers to all forces and influences that enumerate from the environment. It includes all types of activities, social, cultural, spiritual and economic which, in all their totality, affect development.

Children born in a 'free' environment or a "restricted" environment follow a distinctive pattern of development. Experiments have been carried out on animals as well. It has been found that dogs brought up in restricted environment showed a definite pattern of growth. This environment also creates a lot of 'fears' and 'anger' among them. They also showed little avoidance of the noxious stimuli i.e. the little pain. The restricted environment had prevented the normal development of pain perception.

Complex development of adult emotions like fear and anxiety are also affected in a hostile or a restricted environment. Fear-like patterns of behaviour and experiences are also likely to be developed in a hostile environment.

Another leading support that an environmentalist can draw is from anthropological and cultural studies. The type of culture in the environment, they assert, shapes the personality of a person. If the culture is liberal and permissive, the type of personality that develops in it is different from the culture which is based on authoritarianism and regimentation. In both the types of cultures, there are standard ways of performing actions, of acting and working. Each culture has a particular essence in it and it emphasizes a definite mode of personality and life. Accordingly, system of beliefs, conventions, morals, sanctions, laws and conveniences can influence capacities and abilities in persons who live in that culture. Since culture tends to educate, it serves as a sort of social heritage to people. Rich cultural life produces personality with rich experiences and the environment where there are conflicting cultural forces changes in personality of people may take place in an imperceptible manner. Values and ideals blurred.

An environment, characterized by superficial interests and ideals,

is likely to create a sense of shallow outlook in people, with predominantly mundane attitudes. There has been concern for human values like truth, beauty and goodness in societies where environment has been poor and unhealthy. A new brand of materially oriented generation is likely to be fostered in sterile or uninspiring environment. Proper socialisation may not be possible in an environment where social interaction is not properly ensured. The form of behaviour and manner of thinking in students can be radically affected if modes of behaving are restricted. These illustrations reveal that environment in all its manifestations—social, economic, cultural, political—has great potentialities in affecting change in the behaviour of a person.

It has also been found that poor environment can produce serious maladjustment in a person. Such characteristics like poor home conditions, fatherless families, bad mothers, and subjugation to cruel treatment are responsible for creating unhealthy trends in personality. If wants and needs are not properly and judiciously gratified in the environment, personality gets dominated by personal idiosyncracies which later become responsible for developing maladjustment among victims. An impoverished environment tends to develop militancy in a child in later years which may foster such tendencies like that of destroying tendencies, participation in delinquency acts, etc. Poor environment tends to weaken the identity which may produce many difficulties in the personality of the person.

The influence that environment can produce on the development of personality is given in the following quotation from Fredenburg:

"Obviously, this was no genetically based structure of personality but rather a dynamic formation growing out of environmental influences. Elkins (1959), an historian, sees slavery as exerting a crushing blow upon the personality not dissimilar in its effect from that of the concentration camps of Nazi Germany. He maintains that both were closed system which produced profound personality change in the individual. A high degree of dependence was introduced in both systems. There was a total acceptance of the plantation owner as a father-figure among Negro slaves in much the same way as prisoners of war accepted the Nazi SS guards."³

Deprivation in the early years of childhood can have spurious repercussions on the development of the personality than in later years. The studies, made by Bloom, were based on various subjects. He had taken identical twins who were reared apart in differential environment and educated in healthy and vitalizing environments.

3. Fredenburg F.A., *The Psychology of Personality and Adjustment*, Cummings Publishing Co., California, p. 326.

His studies were also based on Negro children. Quoting results from Bloom, Dececco quotes:

"You can see that one-half of the development of the intelligence occurs in the first four years. Early deprivation, therefore, can be much more serious than deprivation in the years from eight to seventeen...Bloom is hypothesizing that a change from a deprived to an abundant environment can mean the gain of 20 I.Q. points. Such a change, in the realities of our occupational world, can mean the difference between a profession and a semi-skilled labouring job."⁴

Dececco concludes that studies by Bloom indicate that early home environment has great influence on the child's development. As much of the child's intellectual development tends to occur in early years, elementary school years are the most crucial period of advancement. It is, thus, evident that environmental conditions, in which a child lives, has positive bearing on the intellectual and educational development of a child. Environment, constructed by social class and occupational level of parents, plays a significant role in the development of personality and intellect of children.

Environmental changes have brought changes in the I.Q. of children. Many studies have proved his hypotheses. Dececco states:

"The most celebrated of these studies are the Scottish surveys of 1932 and 1947, as reported by the Scottish Council for Research in Education (1953). In 1932, intelligence tests were administered to nearly all eleven-year-old Scottish children (87,498). In 1947, the tests were given to children of the same age (70,809). The average scores showed a small but significant improvement over the fifteen-year period. In another study, Laster Lockceler (1942) compared the intelligence of East Tennessee children over a ten-year period. During that time the schools in the area had improved their circulating libraries, the training of their teachers, the availability of free textbooks, and so on. Wheeler found that the average mountain child had gained ten points in I.Q. or nearly one point per year during the ten-year period. In a third study, Read Tuddenham (1948) compared soldier's intelligence in World Wars I and II. The average I.Q. score for World War I soldiers was 62. For World War II soldiers the average score was 104. It is also highly significant as 83 per cent of World War I soldiers scored below the average of World War II soldiers. Tuddenham attributes these dramatic differences to the varying amount of education of the two groups. Soldiers in the first War had an average of about eight years of education, those in the second War, an average of ten years."⁵

In psychology, social environment has to be characterized in

4. Dececco, J.P., *The Psychology of Learning and Instruction: Educational Psychology*, Prentice-Hall of India Pvt. Ltd., 1970, pp 211 and 213
5. *ibid.*, p. 212.

accordance with age, mental level and individual needs of the person. The life-space of a person is different from time to time. As the age advances, there has to be general extension and differentiation in the social environment of the person. A larger environment has a different psychological significance than a restricted environment.

Psychologically, critical conditions like uncertainty and friendlessness in the social environment are likely to produce certain fundamental changes on the person. It may alter the intellectual appreciation of the problem on the part of the person. Quality of life-space, in the social environment, develops various bonds in the mind of the person.

Social environment exerts considerable influence in the development of the personality of a person at all stages of life. Social environment may also include influence like average and individual milieu of the person. There is a fundamental dynamic relationship between the individual and the environment. Total situation develops concrete individuality. The forces in the social environment are important for the development of child behaviour. Human behaviour experiences intrinsic maturation in a rich environment. Social environment is not generally understood properly. Psychologically sometimes it is meant to mean the momentary situation in a child's life. But it refers to a milieu having some chief characteristics of a permanent situation.

The same physical object may have quite different sorts of psychological existence for different children and for the same child in different situations. It appears to be so as there is direct relationship between the momentary state of the individual and the structure of his psychological environment.

The environment may have quasi-physical and quasi-social characteristics depending upon the needs, phantasies, and necessities of a person. This provides dynamic meaning to the environment, which has its own functional possibilities and critical properties. The properties of the environment are determined by valences, strength, and vectors. These factors, according to gestalt psychology, determine the important properties of the environment.

Thus, environment means social, moral, economic, political, physical and intellectual factors which influence the development of the individual. All these factors mould and influence the behaviour of a person from time to time. Two individuals born with the same biological heritage differ because of differing environments. Environment is nothing but a process under suitable conditions to change the shape of a raw material just as a potter does while making toys of mud.

Heredity vs Environment

As in most aspects of development, there is always the question, which is more important for personality—heredity or environment. According to traditional views, the personality of the individual was believed to be a direct result of his heredity. This is expressed in the saying 'A chip off the old block.' Because people were so certain that the child was born with a personality trait. The child was permitted to grow up with such traits becoming stronger—effort on the part of his parents being directed towards trying to discover which side of the family was responsible for these traits; instead of putting the same energy into an attempt to correct them.

Later, with the spread of the Freudian point of view concerning the growth of personality disorders as resulting from unhealthy environmental conditions, the pendulum swung to the opposite direction and major emphasis was placed on the role played by environment. Today, a middle-of-the-road interpretation is being accepted in place of the extreme view, which placed the whole emphasis either on heredity or on environment. It is now rather generally believed that the foundation of personality comes from the maturation of heredity traits, but that these are influenced, partly through learning in connection with direct social contacts and partly, through conditioning. This point of view is expressed by Landis who holds that personality is dynamic, a growing entity. Psychologically, it is vested with the capacity for maturation. Except as mutilated by environment, physical traits follow their predestined course from childhood to maturity. Psychologically, it is plastic capable of an infinite number of modifications by external stimuli. Sociologically, it is dependent on the group to provide the patterns of development, for human nature is a group project.

Considering the bulk of evidence available, it may be stated that there is a definite operation between heredity and environment. Modern researches have shown that every trait of the individual and his every reaction depend both on the joint impact of the heredity and the environment. In no way can the environment and hereditary factors be sorted out in two exclusive categories. There is a constant interaction between the hereditary and environmental forces on an individual and they operate in an integrated and collective manner. Although the importance of the two may be relative only, it cannot be said that their operation is exclusive. Hereditary factor may operate differentially but this *differentiation* is determined by the environment. All said and done, the relative importance of the contribution of hereditary and environmental forces in the development of an individual depends on many factors and it would contain an infinite number of possible answers.

Viewing these factors in an objective manner, heredity and environment have a cumulative significance and they cannot be understood without proper qualifications. Heredity and environment

imply many influences, specific in their own way and yet interactive and interdependent in their operation. In the process of development of the individual, interaction occurs within as well as between the specific factors in each of the two categories. Each gene has its specific chemical and other properties but they ultimately operate into a field of total force that is an individual.

The importance of both nature and nurture for the development of the child is shown by many studies. The students of nature-nurture problem have tried to understand this question by studying the origin or differences in mental abilities, on the average, between various socio-economic groups, occupational groups, national groups, etc. Further, this controversy has also been tackled by studying children of identical genetic constitution, or heredity including children of identical multiple births and also on children whose genetic constitutions are known to be dissimilar. In various studies, nature has been kept constant and in others nurture. Studies conducted in 1960's have shown that generally both nature and nurture are significant even though the importance of each in terms of percentages is now indeterminate and may continue to be so. Further, Blatz and Millichamp studied the mental growth of the Dionne quintuplets. The report states that these individuals, presumably identical, manifest differences in emotional and intellectual traits which the authors conclude have been environmentally caused.

The controversy over nature-nurture will lose its colour once it is seen that mental development always takes place in some kinds of environment and is the result of integrated action of nature and nurture. From the accounts of extremely deprived children, it is clear that mental development always requires cultural experiences within our society. Since mental ability is measured in terms of behaviour consistent with our culture concepts of intelligent activity, the impact of environment cannot be considered inconsiderable.

Mental abilities, according to the present research evidences, are seriously limited in its development in an environment which is markedly deficient. Variation in cultural environment, including schooling opportunities, are of great significance. Educationally, this fact cannot be ignored for it means that many children can, as a result of nursery-school experience, achieve a higher level of mental development that they could do without such opportunities. Improvement in the environment can improve a child and deficiencies in it would retard his many-sided growth and achievement. A recent publication by Schmidt has shown that many boys and girls can be spuriously classified as mentally deficient due to unfortunate and deeply rooted environment factors.

From the foregoing paragraphs, it would not be justified to conclude that one's personality is a product of heredity alone. Environment also plays an important part in the growth of a person.

Development in a person is related both to heredity and environmental influences and both determine overall growth.

The hereditary-environment controversy is reflected in empiricist-rationalist controversy. Empiricists, who emphasize experience, tend to play down the influence of heredity by stressing the crucial importance of experience. They compare the mind at birth to a blank state. Ideas appear in the mind only when environmental impressions are received by it. They assert that there are no innate or inborn notions or ideas. Everything is learnt by sense experiences.

But this is only a one-sided story. Adaptive reflexes and complex instincts suggest that there are some inborn tendencies which predispose a person to act to various stimulations in his own way. Infants and children leave individual ways of reacting to things. Talent is inborn. Training and special environment can develop it. Sense experiences cannot work independently of talent.

Butcher has summed up the problem in the following words:

"It should be realized at once that hardly any observable quality, physical or mental, can be ascribed to the influence of heredity alone or of environment alone. Even where a particular observable aspect of behaviour has been shown to be directly influenced by a gene or single genetic unit (such cases are rare in the study of human beings), this is no guarantee in itself that the behaviour is not also substantially dependent on variations in the environment. This principle is illustrated by a finding of Hogben about the fly *Drosophila*, in which he established that two distinct genetics mutations affect the number of facets in the fly's eye."⁶

In short, it could be maintained that the effects of heredity and environment are interwoven from the time of birth and they cannot be isolated and studied in pure form. While the heredity determines the level, environment determines the functions of these abilities.

Educational Implications of Nature-Nurture Problem

In view of the very considerable over-lapping of mental abilities between children of several occupational levels, and in view of the fact that all levels of mentality are found among children of parents in each of the occupational levels, the point of educational significance is that the occupation and economic level of a family does not provide a basis upon which to evaluate the educational promise of any given child. With regard to this aspect of the nature-nurture problem, it is essential that for the sake of developing the child, total influence on the child must be conducive.

6. Butcher, H.J., *Human Intelligence: Its Nature and Assessment*, Mathuen and Co. Ltd., London, 1968, p. 150.

In the classroom, the teacher should understand the nature mechanism of these two bases of behaviour. This can be so in order to diagnose and guide the growth and development of children. For instance, if a child is mischievous, it may be due to the fact that he comes from a home where good manners are not emphasized. Similarly, a child may fail to learn due to the vital deficiency in his physical condition, or because of insufficient motivation.

To enrich learning, teacher should always stimulate the environment to the maximum. Without environment stimulation no organism could live or grow in a vacuum. Without stimulation, no modification or differentiation of behaviour is possible. Since a few differences, existing between children have been traceable to the environmental differences, homes and schools should provide experiences to children which would help them to develop to their maximum.

Teachers should develop a realistic attitude in children. Further, teachers should also develop a fair and impartial attitude towards the potency of the organic and environmental forces in education, and they must endeavour to promote the growth of behaviour of each child under realistic and appropriate conditions. To understand the child, teachers must know him as a biological organism with needs and goals and must know his social and psychological environment of which he is a part.

In view of the background and evidence produced in the preceding pages it is evident that the separation of developmental factors into heredity and environment is not sound. Both the factors operate together and one is inconceivable without the other. The level of mental development depends on innate potentialities and also upon the quality of environment during the developmental period. To stimulate a pupil fully, enlightened, democratic, social and educational practices will have to be made available to him at school.

An average teacher needs to realise the tremendous significance of environmental, hereditary and cultural factors for the child's development. Attitudes, adjustments and behaviour patterns have to be structural to suit the child's ability and development.

Education means the modification of the behaviour of the child. Thus heredity and environment are two great forces, responsible for human behaviour and personality and these both should be studied by the teacher and parent. Nature and nurture are both potent factors in the development of the child. One is seed and other is soil. One is spirit and the other is body. A successful teacher must know all about this.

The truth lies in the fact that both environment and heredity are needed for the development of the individual. The practical

gardener knows that both seed and the soil are necessary for the proper growth of a plant. He could never grow a good crop from a poor seed, no matter how rich the soil, nor even from the best of seeds sown in poor soil. Just as the development of a plant depends upon the heredity present in the seed as much as on the environmental stimuli of soil, moisture and sunlight, etc., much similarly the growth and development of the individual personality is the outcome of both these factors. In other words the growth of the individual is product of environment and heredity and not merely a sum of the two. The relation of heredity and environment is more like multiplication than like addition. Just as the area of the rectangle is not equal to the base and the altitude, but is equal to the product of the base and the altitude, similarly the individual development is not equal to the heredity and environment but it equals the product of the two. Just as we cannot say that the area of a triangle depends more on the base or more on the altitude, for if either of them is zero there will be no rectangle and hence no area whatsoever, much similarly we cannot say that the individual depends more on the heredity or more upon the environment, for if any of them is absent there will be no individual whatsoever. Without heredity, the individual will not come into existence at all and without environment it will not grow, it may result in still birth. All development, therefore, depends upon both heredity and environment.

PHYSICAL DEVELOPMENT

PHYSICAL development means the progressive development of the various parts of the body and their capacity to function. From conception until death, the individual is constantly changing. He is never static. Throughout the childhood and adolescent years, he develops into the adult. Even then, changes do not cease. Instead they continue at a slower rate. Thus, development is a continuous process which starts even before birth. However, in the early years of life the physical changes are rapid in rate and pronounced in degree. Each physical change is dependent upon what preceded it and in turn, affects what will come after.

Physical growth influences behaviour and behaviour, in turn, influences physical growth. As Anderson has pointed out, "As soon as one works with children, he becomes aware that the behaviour is an end-product determined by many factors, some of which are clearly related to physical make up and physiological state of the child. He quickly becomes concerned with the problems of physical growth, body form, physiological adjustment, appetite, etc., all of which affect the adjustment of the child."

Bearing on Education

Knowledge about the physical growth of children is important for several reasons. Estimates of a child's age are constantly being made on the basis of his size and he is treated and expected to behave accordingly, but many things, besides age determine children's sizes. Numerous and complex hereditary factors—specific, familial and racial—determine the basic growth, tendencies and potentialities. Given these potentialities, the course and extent of growth may be altered by a variety of environmental influences. Health, certain types of illness and nutritional conditions have profound effects on the course of physical growth and there is some likelihood that illness makes terrible personality difference. Endocrine imbalances which may be hereditary or environmentally induced can cause wide deviations both in size and in rate of maturing.

Physical growth influences behaviour, and behaviour, in turn, influences physical growth. As Carrel¹ has pointed out: "the individual is a compound of tissues, organs, fluids and consciousness." The interrelationship between physical growth and behaviour is so important that an understanding of how the human child grows and develops is essential to an understanding of the similarities and differences between different individuals and the changes that take place in the same individual with increasing age.

The child's physical development has a marked influence on the quality and quantity of his behaviour. This influence may be direct. Directly, a child's physical development at a given age determines what he can do. If he is well developed for his age, he will be able to compete on equal terms with the peers in games and sports, if not, he will be handicapped in competition with them and may be excluded from their games. How he feels at the moment—whether he is well or tired or ill has a direct effect on his development.

Indirectly, a child's physical development influences his attitudes towards himself and others. This, in turn, is reflected in the type of adjustment he makes. A child who is markedly overweight for example, soon, discovers that he cannot keep up the pace set by his teenaged mates, and this often leads to a feeling of personal inadequacy.

According to Bookwalter² body size and shape have been found to influence the child's physical performance. Thin boys of average size perform better than boys of medium physique or average height. Those who are large and obese are the poorest performers of all. Marked deviations in size not only affect the child's behaviour but also his social acceptance by his peers. The obese child loses out in active play and, as a result, lacks the necessary opportunities to learn social skills which are essential to social success.

According to Merry³ dietary deficiencies lead to loss of energy, which, in turn, makes the child behave in a manner that suggests that he is lazy or dull. He frequently whines, is fretful, and makes poor social adjustments. Society accepts certain behaviour at certain ages. The child who does not come up to these standards, because of lack of energy, or some other physical conditions, is likely to be regarded as maladjusted.

Deafness, blindness, or a weak heart keeps the child from entering into the play activities of other children. The result is often

1. Carrel, A., *Man the Unknown*, New York, Harper.
2. Bookwalter K.W., "The relationship of a body and size and shape of physical performance," *Res. Quart. Amer. Phys. Edn. Association*, 23-271-279, 1952.
3. Merry, F.K., "Temper Tantrums." In *Encyclopedia of Modern Education*, New York, Philosophical Library, pp. 821-22.

the development of unfavourable attitudes which colour the child's whole behaviour. The child who suffers from some physical defect is often neglected or even ridiculed by other children.

According to Hurlock⁴ good health is essential not only to normal growth, but also to normal activity. The child whose health is poor, even though he may not be actually ill, is handicapped in his mental and physical growth. Illness in childhood influences the behaviour and attitudes of the child. There is evidence to show that serious or prolonged illness influences the child's attitude towards self and this, in turn, affects the quality of his behaviour in all areas of his life. Illness that leaves a damaging effect on the child's body likewise leaves scars on his personality.

According to Hardy⁵ health conditions in childhood are closely associated with the socio-economic status of the family. Poor general health conditions are more frequent than good general health in children from the lower income group classes. Socio-economic status influences the diet of the child during the growth years, and this is largely responsible for the condition of his health. Income, size of family and management are largely responsible for the quality of the child's diet.

According to Everitt⁶ a comparison of elementary school children whose diets were rated as good and poor showed that the group with the good diets were superior to that of poor diet in physical status, mental status, in educational ratings and definitely superior in social adjustments. The child whose health is good shows this not only in his appearance but also in the quality and quantity of his behaviour. Children in poor health, by contrast, reveal the status of their health by their appearance and by lack of energy, decreased activity and by emotional tension.

GROWTH CYCLES

Growth is rhythmic and regular. A child does not grow a given number of inches in height. Growth comes, on the contrary, in cycles or waves, the "periods" or "phases" of growth. This growth is not random and haphazard. As Krogman⁷ has pointed: "The child outgrows in obedience to certain biological laws."

Studies of growth cycles have revealed that there are four distinct periods, two characterised by slow growth and two by rapid

4. Hurlock, E.D., *Child Development*, McGraw-Hill Book Co., Inc., New York, p. 106.
5. Hardy, M.C., "Frequent Illness in Childhood, Physical Growth and Formal Size." *Amer. J. Phys. Anthropol.* 23, 241-60.
6. Everitt, V., *Good Habits and Wellbeing of School Children*, Elementary Sch., 52, 344-50.
7. Krogman, W.M., "Facing Facts of Face Growth," *Amer. J. Orthod.* pp. 279-84.

growth. From birth to two years, there is rapid growth. This is followed by a period of slow growth upto the time of puberty or sexual maturing, beginning usually between the eighth and eleventh years. From then until fifteen or sixteen years, there is a rapid growth and this is followed by a period of fairly abrupt tapering off of growth to the tune of maturity.

Development of Nervous System

The growth of the nervous system is very rapid before birth and the first three to four years after birth. Growth during the pre-natal period consists primarily of increase in the number and size of nerve cells. During the post-natal years growth consists primarily of the development of immature cells present at birth rather than the formation of *new cells*. After the age of three or four years, growth of nervous system proceeds at a relatively slow rate.

Brain growth cannot be studied directly, but can be estimated from studying the brains of the dead or from external measurements of the cranial development of living children. These measurements show that brain growth is very rapid from birth to four years slowing down between the ages of four and eight years, and then progressing very slowly until approximately the age of sixteen years, when the mature size of the brain has been attained.

At birth, brain weight averages 350 grams as contrasted with adult weight, which ranges from 1,260 to 1,400 grams. One-fourth of the adult brain weight is attained by birth, one half by the age of nine months, three-fourths by the end of the second year, four-fifths by the fourth year and 90 per cent by the age of six years. To show how rapidly the brain grows in early childhood as compared with the latter part of childhood, it is interesting to note that at birth, brain weight is one-eighth of body weight; at ten years, one-eighteenth, at fifteen years, one-thirtieth, and at maturity, one-fortieth. (See graph showing differential rates of growth for various parts and organs of body).

Physical Growth during Infancy

As already said, infancy refers technically to the first year of life. This first year of life is of tremendous importance to the progress of the individual. Physically and mentally the infant is growing rapidly. The recent interest in the pre-school child has given us much information of the first three or four years of life. Of course, even before birth, during the pre-natal stage a great amount of growth has taken place. At birth, the brain is almost one-fourth of its final weight, while most of the other organs are relatively less developed. The brain continues its rapid growth during the first few years of life and at the age of five or six has attained about 90 per cent of its ultimate weight. (see Fig. 1)

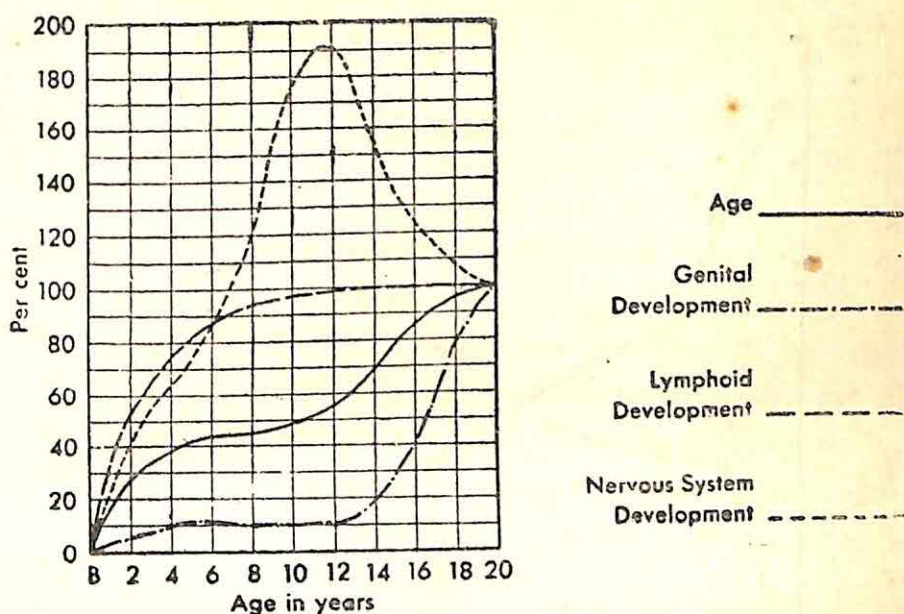


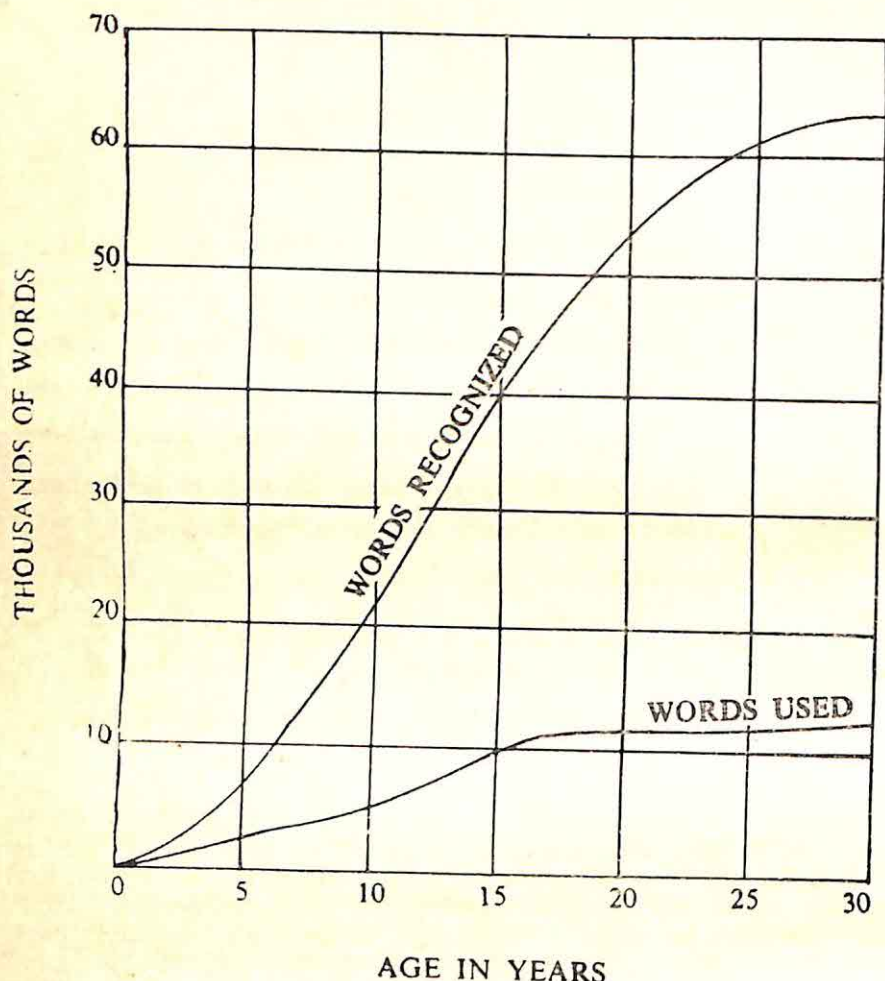
FIGURE 1

This graph shows differential rates of growth for various parts and organs of the body. (From S. Harris, *Measurement of Man*, Minneapolis: The University of Minnesota Press, 1930.)

Studies by Gasell and McGrow

Careful studies of young children such as those made by Gasell and McGrow reveal the rapid maturation of these early years. Gasell⁸ differentiates four types of behaviour—motor, language, adaptive and personal. He shows how the normal child develops in a normal environment in these four respects from month to month. Thus, in motor development at one month he lifts his head from time to time; at two months he holds his head from time to time and he holds his head erect for a short time; and so on to five months when he sits if supported up; to eight months when he sits without support; at twelve months he is walking with help; at eighteen he is climbing stairs; at twenty-four he is running. We are all familiar with this rapid motor development of the child. Gasell gives us the details for each month during the first year of life and for longer intervals thereafter. Physical maturation follows a cephalocaudal direction; the rate of growth is faster at the head in initial stages until this area has been well developed; growth then becomes more rapid towards the lower parts of the body (see Fig. 2). In language development the early life of the child is no less, or perhaps even more remarkable. For a few months he makes no vocal response of a language type;

8. Gasell, A., *Child Development*, New York, Harper, 1949.



AGE IN YEARS

FIGURE 4

Mental development is indicated by growth in vocabulary (From John, J.B. Morgan, *Child Psychology*, 3rd ed., Rinehart Company, Inc., New York, 1942)

sex function is taking place. It used to be thought that adolescence was marked by a sudden spurt of growth that a 'new birth' took place, that new traits and powers suddenly appeared. But recent study lends no support to this view. This period prevents certain problems which arise from the basic needs. According to Hollingworth⁹: There is (i) need for freedom from dependence upon family; (ii) need for association with opposite sex; (iii) need for self-support and (iv) need for a theory of life.

9. Hollingworth, *Gifted Children: Their Nature and Nurture*. New York, Macmillan.

Adolescence gradually merges into maturity. It is the period when growth has reached the highest point. This period makes us behave like men and women.

Factors Affecting Physical Growth and Development

Physical growth depends partly upon food and general health conditions, and partly upon such environmental factors as sunlight, fresh air and climatic conditions. Physical growth is not due to one factor alone but to many, each related to the others and all interdependent. The factors influencing physical growth are as follows:

1. Food

At every age, but specially in the early years of life, feeding is of great importance to the normal development of the child. It is not only the amount of food eaten that is important; the vitamin content is as important as, if not more important than, the quantity. Defective teeth, skin diseases, and other health disturbances can be traced directly to poor diet during infancy and childhood.

2. Fresh Air and Sunlight

The size, general health condition and maturity of age of the child are influenced by the amount of fresh air and sunlight that the child gets especially during the early years of life. This is evident when comparisons are made between children of good and poor environment.

3. Sleep

Sleep is as essential as good food, if the child is to achieve proper growth. Good sleep is not possible unless the child has a safe and comfortable bed of his own where he can sleep undisturbed by light or noise. As far as possible each child should have a bed to himself. Children should have a bed-room to themselves. However, if this is not possible and if the children have to sleep in a verandah or in a space which is used for some other purpose in the day time or during night, care should be taken to keep it free from noise and light when it is the children's bed time.

The amount of sleep the child should have varies with age. According to Hurlock, the 2-year child needs 12 hours at night and two hours nap in the day time. The nap shortens as the child grows from 2 to 6 years and bed time at night remains the same. The amount of sleep needed varies from child to child. But children should have a regular schedule.

4. Exercise

Exercise is very essential for the child's muscles to develop. Babies must have an opportunity to exercise their muscles for at least one hour daily. The exercise period may be given either in the morning or afternoon depending upon the mother's convenience, for the baby should be completely naked. Same period may be devoted to spontaneous kicking of the legs and waxing of the arms. The help of an adult is needed particularly for exercises to help the strengthening of back muscles.

Physical characteristics:

From 5 to 8 years

1. About 40 inches tall (annual average growth, 2 to 3 inches).
2. Are still physically dependent.
3. Definition is irregular.
4. Exhibits extreme motor activity, emphasis in muscular activity is on speed and energy.
5. Girls mature faster than boys.
6. Legs lengthen rapidly.
7. May take larger food than stomach can hold.
8. Nose and throat difficulties are more frequent.
9. Postural defects appear.
10. Rate of growth in height and weight slows down between age 5 and 11, but there is steady and uniform increase in size.
11. Resist taking a bath.
12. Show gradual improvement in speed, steadiness of movement and accuracy.
13. Average gain in health.

From 9 to 11 years

1. Are extremely active.
2. Are normally sturdy and healthy and relatively free from disease.
3. Are picky about food but eat a great deal.
4. Boys have half their adult weight and are approaching their adult weight.
5. Girls increase steadily in physical skills upto 11 after which skills remain stationary.
6. Girls usually do not have as much stamina and health as boys.
7. Growth in strength temporarily ceases in girls from eleven to thirteen.
8. Interested in active, competitive games which require motor skills.
9. Make erratic choice of foods.

10. More easily fatigued after physical activity.
11. Small hand muscles develop.
12. Speed steadiness of movement and accuracy improve as age increases.
13. Girls show a sharp increase in both height and weight until 11th year, boys are likely to be better and heavier than girls.

From 12 to 14 years

1. Allergies are fairly common, appetite voracious and picky.
2. Girls reach sexual maturity one or two years earlier than boys.
3. Rapid physical growth often results in awkwardness.
4. Serious lack of balance between bones, muscles, heart and lungs.
5. The average girl is likely to be taller, heavier, and more developed physically, mentally than the average boy of the same age.
6. Tire easily but are reluctant to admit it.

Needs from 5 to 8 years

Adequate sleep for 10 to 12 hours help in acquiring care of teeth, frequent periods of rest and recreation, active play, guidance in eating, for having handedness recognised, for large play space, for learning to use towel, to keep objects out of mouth, for prevention of childhood diseases, measles, mumps, chicken pox, for prolonged convalescence if contracted for relaxation from tension during eating hours, for sympathetic understanding of lack of muscular coordination, and to know how to dress appropriately for weather.

From 9 to 11 years

For adequate creativity rhythms, for careful eye examination, for correction of posture, for different kinds of play for both sexes, for frequent change of activity to avoid fatigue, for independence in caring for personal and health needs, for physical activity involving more muscle control, for plenty of opportunity and stimulation to improve and display motor abilities, for strenuous physical activity with supervision, adequate nutrition and adequate sleep.

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SOCIAL DEVELOPMENT

THE maturing and growing child develops not only in physical, mental and emotional behaviour but also correspondingly in social development. The child's range of social activities is interwoven with other features of his growth, i.e. physical, mental and emotional. Language is the result of interrelation between mental and social behaviour. Jealousy, shyness, affection and sympathy are the result of interrelation between social and emotional forms of behaviour.

What is socialisation? "Socialisation is the process of presenting alternate channels for individual behaviour together with positive and negative sanctions which will lead to the acceptance of some and rejection of others. It emphasises the influence of social groups, formal and informal upon the personality of individual." (Havighurst). Beginning with the nursery, the process of socialisation continues throughout life. Among other things what must be learned is: the power to inhibit or to moderate the expression of unacceptable needs, ability to adapt to schedules i.e. to do things at proper time. This assumes that having acquired these abilities, the average person will be capable of establishing satisfactory interpersonal relations within the legal and conventional framework of society. *When the child begins to behave in a predictable, expectable manner, it is well on the road to being socialised.* Socialisation arises from organic and environmental factors. Socialisation is partly 'a native' and partly a 'learned' series of responses. Habit plays an important part in socialisation. In socialisation three factors are included: (a) the basic characteristics of protoplasm itself; (b) certain original mental equipment i.e., cerebral cortex; and (c) certain affective and emotional development which comprises ductless glands. In socialisation the changes pass from impatient, self-centred, pleasurable seeking infant, concerned only with himself and with his own survival to defer his pleasures, considers others, becomes educated, self-control and develop eventually to assume some responsibility in society. This process is a

complicated process and involves many complicated factors. Crow & Crow says:

“The young child’s play activities illustrate a progressive change from individualisation towards socialisation. At the age of two months, the infant is expected to hold a small block that is given to him. Later he appears to gain satisfaction from manipulating blocks and other simple toys, but he plays alone. Child of two years will play with his own toys in his own corner of the room, even though another child is playing with toys in another part of the room. The only awareness of the child that is exhibited is his attempt to take the toy with which the other is playing. This behaviour may result in tug of war between the two children for the possession of the toy. Gradually, the concept of ‘I’ as opposed to ‘you’ has more meaning for the child than it did earlier. Other children are brought into the child’s life. He still acts in accordance with the policy that what is mine is mine but he is also growing in the understanding of the fact that what is yours is yours. As the child approaches his third year, he may come to realise that what is mine is yours also. This indicates that the child is well on the road of socialisation.

Social development means acquisition or the ability to behave in accordance with social expectations. It has been defined as “the process by which an individual born with potentialities of enormously wide range, is led to develop actual behaviour which is confined within the much narrower range—the range of what is customary and acceptable for him according to the standards of his group.”¹

Thus the social development of the child has two aspects. On the one hand, the individual learns the particular ways of his society. This is known as socialisation. On the other the individual progressively expands his social horizon. He learns to include more and more people in his group, in which he feels at ‘home’ and for which he will make sacrifices. He becomes a citizen of the local community and learns to get along with people. He joins a variety of groups which help him to cultivate his own particular interest. He becomes a highly developed person in the social sense.

According to Hurlock² social development means the attaining of maturity in social relationships. It means the process of learning to conform to group standards, morals, and traditions and becoming imbued with a sense of oneness, intercommunication and cooperation. This involves the development of new types of behaviour, a change in interests, and the choice of new types of friends. The

1. Hurlock, E., *Child Development*, McGraw-Hill Co. Inc., New York, 1950, pp. 257-60.

2. *ibid.*

social individual is one who not only wants to be with others but who wants to do things with them.

No child is born social. He must learn to make adjustments with others, and this ability can be acquired only as a result of opportunities to be with all types of individuals, especially during the years when socialisation is an important phase of the child's development. Like all development, this requires planning and guidance on the part of those who are in charge of the child if the most desirable results are to be achieved. Social group exerts a marked influence on the personality of the child.

Influence of Social Group

Every child, like every adult, is dependent upon other people for his existence. The dependence is complete at birth and during the early years of babyhood. As the child becomes older, he becomes less dependent upon the social group. Nevertheless, he still needs the group and contacts with others. During each succeeding year his relations with others become more complex and must be in contact with more people as well as with people of different types.

Not only is the child dependent upon the social group, but of even more importance, the social group upon which he depends determines to a large extent what type of individual he will be. Because he is plastic, both physically and mentally, his development can be influenced and moulded into a pattern determined by members of the group with whom he is most often associated. At no age is he free from the influence exerted by his associates. This influence is especially pronounced during the early years of life, because this is the time of greatest plasticity. At the time the child's family is the most influential socialising agency in his life. When he goes to school, his teachers and his peers begin to exert an influence over his personality and the process of socialisation. Peer influence is greater than teacher influence.

One of the most important ways in which the child's peer group influences him is by helping him to achieve independence from his parents and become an individual in his own right. Through his association with his peers, he learns to think independently to make his own decisions, to accept points of view and values not shared with his family and to learn forms of behaviour approved by the group to which he belongs. According to Jerschild this is a meaningful process through which he changes from complete dependence on others into a person who can hold his own with his own age group and move with his age group into youth and adulthood.

Pattern of Development

Social development follows a pattern, in an orderly sequence, not only in the type of social behaviour displayed at each age but also in the type of companions selected. This means that normally every child should pass through certain phases of becoming socialised at approximately the same age as children pass through the same phases. According to Gessel bright children are accelerated in social development, while dull children are retarded in their progress towards social maturity. Knowing what a pattern of social development is, one can readily predict that at a certain age the child will be timid in the presence of strangers, at another age he will crave the companionship of individuals of his own age and sex, while at still another age, his interests will be centered on members of the opposite sex.

Studies of groups of children have revealed that there are age levels in social development. While the two-year-old is solitary in his play he is nevertheless influenced by older children to the extent that he imitates their behaviour both in play and in conduct. The 2½-year-old refuses to share toys with others and grabs toys from them, ignores requests and refuses to comply. The three-year-old shows the rudiments of team play and the four-year-old shows the beginning of group influences by being conscious of other's opinions and trying to gain attention by "showing off". At first, young children lack group feeling. Then a phase of partial adjustment occurs during which the child begins to establish his role and to play in a somewhat coordinate fashion with others. In the third phase of the pattern of social development group relationships are established and the child enjoys group life. At this time, the group invents and organises its own group names and becomes an independent unit, free from adult supervision and interference. Throughout the later part of childhood, there is an increase in social contacts. The size of the group and the frequency of participation likewise increase.

DEVELOPMENTAL PERIODS

First Two Years

The first two years of social development are extremely important in the life of the child. Freud says that these two years determine most of the basic social attitudes of the individual. During this period, a child acquires a somewhat elaborately configured self-command of the language to some extent, knowledge of many tools important in social living, skill in the use of simple methods of attack, and resistance, partial control of physiological functions in accordance with society's dictates and some desire to conform to the will of his peer group.

Nursery School Years

In the years from 2 to 5 progress along social lives seems almost as dramatic as in the first two command of speech is speedily acquired and speech is used increasingly as a substitute for overt action. Children during nursery years are also becoming increasingly conscious of their roles as members of a given sex. They choose company from members of the same sex. Progress in self care is rapid in the preschool period.

SOCIAL CHARACTERISTICS

From 5 to 8 years

1. Accuse adults of being too bossy, too strict, not fair and resist adult control.
2. Are highly competitive, independent and self assertive.
3. Are interested in peer groups than in family groups.
4. Are very social, like to work and play with others, but are beginning to be selective of friends.
5. Begin to show group loyalty.
6. Boys have more lasting friendship.
7. Develop a recognition of needs and the desires of other children.
8. Boast constantly.
9. Forms shortlived changing groups.
10. Generally have poor table manners.
11. Motor skill plays an important part in being accepted by peer social groups.
12. Begins to have boy friends and girl friends.
13. Style of clothing, activities, language and ideas are set by the group and are followed slavishly by its members.
14. Tell secrets, set up whispering and giggling campaigns.
15. Intense personal rivalry.
16. Want group acceptance so much that they will ignore behaviour codes set up by adults.

From 9 to 11 Years

1. Act and dress like rest of the gang.
2. Are ready for widening of social contacts.
3. By eleven years boys begin to take interest in girls.
4. Careless about personal appearance.
5. Grow in self-reliance, independence and self-government.
6. Have keen sense of right and wrong.
7. Take part in skills and jokes.

8. Want some social approval from adults.
9. Want to be members of school group.
10. Want to show their independence.

From 12 to 14 Years

1. Assume affectations camouflage feelings towards family.
2. Old rivalries between siblings flare up again.
3. Participate in rituals.
4. Resent teasing and criticism of friends.
5. Show drastic behaviour.
6. Daring, aggressive, critical, boisterous, argumentative, rough, and ready.
7. Less obedient or docile to family.
8. Show extreme devotion to boy or girl.
9. Try many experiments.

SOCIAL NEEDS

From 5 to 8 Years

Help in acquiring competence and skill in coping with a thing or situation that is feared; for girls to have play identifying with mother roles; for boys to have rough games, for prestige in group, size and skill are important factors, to do what others in our age group do (dress), to feel that they belong to the group, to gain skills in personal care, to identify with peers to recognise difference, between own and others property, to recognise own role in relation to others, to work in small groups.

From 9 to 11 Years

Needs adjustment to opposite sex, through working in a complementary manner, for companionship with children of own age, to develop good sportsmanship, for freedom in seeking friendships, for harmonising conflicting loyalties and standards, camping for organised games, for participation in family affairs, budget making, outings, gatherings, to act and dress like the rest of the gang, to have different kinds of play for both sexes.

Social Background of Children

Social background plays a role of major importance in the child's personality development. It also adds pleasure to his every day experiences. It determines to a great extent the standards of the individual child. Social background of the child is of great concern to us because it serves as foundation for further development. Social background includes family influences, locality

influences, school influences, cultural influences and community influences.

Family Influences: The family provides the first human contact for the child. It plays a major role in shaping his personality pattern and in determining his attitudes. The main lines of the personality pattern of the child are formed in the family. What type of home life the child has is important to his personality development. And the type of home life is largely determined by the parents. A good home produces a well adjusted personality in the child. Homes characterised by family discord, unhappiness due to lack of affectional relations among the members of the family, lack of interest in the children, friction among parents, and breaks due to separation, death or divorce lead to emotional instability and poor adjustments on the child's part. Psychologists also point out that of all human relations influencing a child's development, the personality of the mother is of central importance. Of great importance are her attitudes towards pregnancy, towards her husband, her career, her social life, and specially her attitude towards the child and his need for love, recognition and discipline. The mother-child relation is very crucial in babyhood because the child is almost entirely dependent on the mother for his happiness. The baby derives much needed emotional security from the mother's affection.

The child needs the security of parents for achievement of sound mental growth and health. Symonds³ has justifiably claimed, if an individual possesses a healthy, stable, courageous, and loving father and mother, the chances are that he will be a good worker a good husband, or wife, a good teacher and a good citizen." According to Ribble,⁴ poor relationship with the parents leads to reactions in the infant which tend to become the basis of adult personality disorder. The most important asset of the baby as he begins life is two emotionally healthy parents. His deepest need is the understanding care of one consistent individual, his mother. Emotional disturbance in the parents is as dangerous as is tuberculosis or syphilis.

Family serves three general functions in social life. They are :

- (a) Family is the major agency for socialisation of the child.
- (b) Family helps in transmitting the cultural heritage.
- (c) Family is the provision of an outlet for the expression of personality.

The presence of the father is most essential during the period

3. Symonds, P.M., *The Psychology of Parent-Child Relationship*, Appleton-Century Co.
4. Ribble, M.A., *The Rights of Infants*, New York, Columbia Univ. Press, 1943.

from birth to seven years. If there is no father, the boy should have a chance to associate with male relatives and other boys. Father is important because the baby needs a male person to imitate and he needs a masculine foil, in relationship to whom he can learn how to balance his feelings of aggression and love. The girl's relationship to the mother has the same significance as the boy's relationship to the father. The girl also needs a friendly mother.

Family is very important for the social development of the child. It is one of the most significant primary groups—the groups which are first in influencing the individual and in shaping his attitudes and behaviour patterns. Frank⁵ indicates the importance of the family by saying that it is the only institution which is an agency for child rearing, socialisation and for introducing the child to the culture of the society, thereby shaping the basic character structure of our culture forming the child's personality. Thus, the family being a primary group, promotes intimate face to face association and interaction, which is more educational than any other personal interaction. It satisfies most of the needs of the child and provides emotional experiences which stimulate or retard the learning activities of children.

In the past the family had greater influence. These influences have changed with the times, with changing technological advancements, with changing economic conditions and social crisis. The family in the past was the centre of moral education. The older members of the family thought it their duty to acquaint the younger members with the family's moral code. They imparted certain types of religious ceremonies in which every member participated. The family determined the type of social relationships that its members could have outside. It decided the role and status of every member. The younger members were always to obey the elders in the family. The family has been responsible for vocational education as well. Sons inherited what their fathers professed. Professions were passed on from fathers to sons.

The family, now, has different influences and roles. The big joint families of the past are disappearing and in their place we have smaller nuclear families in which the contacts between various members are becoming less and less every day. It is no longer a centre for social activities. Religion is also an individual affair now.

Sibling Influences: The type of relationship that exists among sisters and brothers has much the same influence on the child's

5. Frank, L.K., et al., "Personality Development in Adolescent Girl" *Manager, Soc. Res., Child Development*, 16 No. 53 : 1-316; 1951.

personality as does his relationship with his parents. Ordinal position has been found to have some influence on the personality development of each child. There is a tendency for the first born child to develop a dependence on his parents and this makes it difficult for him to adjust to others outside the home. Furthermore, he is likely to be selfish and to suffer from feelings of insecurity resulting from displacement when the second child arrives. To compensate for feelings of insecurity he often develops tricky and attention-getting mechanisms. The second born child is usually better adjusted, happier, and more generous than the first born.

Size of family has been found to play an important role in the child's personality development. Children from small families not only develop different personality patterns than do those from large families, but on the whole the personality pattern is better.

Very early in life, every child in the family acquires a specific role which comes to be recognised not only by his family but by outsiders as well. The larger the family group, the greater is the diversity of roles.

Locality Influences: The locality influence affects the child's developing personality both directly and indirectly. It determines what standards it will accept and what child training methods they will use. It will also determine where and how the family will live. The physical environment of the home such as size, neighbourhood, general condition of furnishing has great influence on the child's personality. The type of home and the neighbourhood in which it is located influence parental attitudes and are important factors in the development of the child's personality. Poor surroundings and a rundown condition of the home affect parental morale, especially that of the mother and this directly affects the child. Children from poor localities generally make poorer adjustments and have more personality problems than do children from better localities.

Thus, the kind of locality the child has will have a marked influence on his whole outlook on life. The locality will influence the relationship the child will have with his parents, siblings, or any individual who may live permanently or temporarily in the home. Locality has a distinct influence upon the things, persons and ideas we perceive upon our experiences. Of the many factors in the locality which play roles of importance in determining the attitudes and behaviour of the child, the socio-economic status has been found to be most important.

Socio-economic Status : The pattern of life varies according to socio-economic group to which the family belongs. There are marked differences to behaviour patterns in families of different socio-economic status in use of money, in child training and

attitude towards discipline and parents. Middle class parents regard their children with pride and hope. They supervise their children closely and expect them to avoid any behaviour which might bring criticism to the family. The child is encouraged to be independent. Education is emphasised because it is a way of bettering themselves. This is specially true in the case of boys. The middle class child is expected to inhibit emotional expressions and aggressions at an early age. He is given little information about sex and is generally criticised by his parents for his behaviour related to sex. The middle class child is wanted by his parents, is usually brought up in a domestic home atmosphere, and is given as many advantages as his parents can afford.

The attitude of lower class parents towards the child is different. Children from lower class families are given greater physical and social freedom than are those from the middle classes, and there is little concern on the part of their parents about their education. The lower class child often feels unloved, unwanted and rejected at home and thus seeks companionship outside the home.

The socio-economic status of the family influences the type of home and location of the home in the community. This determines to a large extent what kind of associates the child will have. Favourable or unfavourable attitudes will be developed, depending upon the kind of children the child is associated within school and in his recreational activities.

The economic status of the family determines what the family's social status will be. Economic insecurity increases emotional insecurity. Poverty in many cases causes psychic wounds. Aggressive personality problems, such as stealing, truancy and running away are more common in poor homes. School maladjustments are more often found in economically superior homes. Jealousy has been found to increase as family income decreases.

The father's occupation has a profound influence on the child's outlook. In the early years of childhood, it is important as it has a direct bearing on the child's upbringing, such as, his food, clothing and play equipment. However, as he becomes older and begins to play with other children the father's occupation has a cultural significance in that it gives the child social prestige. When a child is ashamed of his father's occupation, either because of the level of the work or because of the type of clothes demanded by the work it will affect the child's attitude towards his father, his home, and himself as an individual.

School Influences : The influence of the school in the social development of the child is very great because the school

becomes a substitute for the home and the teacher a substitute for the mother. Once the child reaches the school age, he spends approximately one-half of his waking time in the school. That is why its impact is second only to the home in the individual's development. And the influence of the teacher is the most important single factor in the total school influence on the child's personality. Directly, the teacher affects the way the child feels about himself, by the way he corrects his behaviour or by the way he interprets his school work. Indirectly, he influences his personality by helping him to adjust to the group—and by helping the group to adjust to him. The attitude of the teacher towards his work and towards children is very important. The teacher who likes his work, understands children, and is enthusiastic about what he is teaching creates a better school climate than does the teacher who has little interest. The personality pattern of the teacher influences the child's personality. As has been rightly pointed out that it is of vital importance to the development of personality in the children that they have teachers who have well adjusted personalities.

School also imparts to children the minimum general culture and the minimum knowledge of some subjects that is necessary for living a useful and successful life. School also prepares each child as a responsible citizen of a modern democracy. An important function which the school has to perform is of character formation and moral education. The family cannot perform this function with regard to school going children so adequately now as they could do some time back.

Playmates and Friends : The young child is more anxious to have the approval of his parents and other adults than of his playmates. But after he has entered school, the approval of his playmates becomes more necessary to him than the approval of his parents. It is then that he turns his attention to development of personality traits which his playmates admire. In the school, early social experiences are important in the development of personality. Through his contact with others, he learns to assess himself, thus laying solid foundations of his personality. The more pleasant early social experiences the child has, the better his outlook on life will be and, in turn, the better his social adjustments.

The popularity of the child plays a considerable part in the development of his personality. Children who are accepted in the social group who feel that other children like and admire them, or who find themselves from time to time in position of leadership in their groups develop a self-confidence and a better personality.

Community Influences : Community influences on the child

are powerful. Parks, playgrounds, museums, libraries are of great help to our children in achieving personal security, a sense of adequacy, and progress towards independence.

The community agencies should have an overall concern for our children. In India, in the complex neighbourhood setting of big cities, there may be a growing awareness of the need for such constructive help as parks, playgrounds, museums and libraries. In the rural areas, facilities do not, on the whole keep pace either with the need or with the demand of intelligent citizens. Yet, the sense that the well-being of children is the responsibility of the community is steadily increasing in our society.

Role of Sympathy, Suggestion and Imitation in Social Development

Man is a social animal. He is in contact and communication with others. He is stimulated by his surroundings, he responds and is responded to. A large part of behaviour is social in character and has social significance. He is not a social isolate. He interacts with the members of his society. The three important elements involved in social interaction are sympathy, suggestion and imitation.

Sympathy means the tendency to experience any emotion where its expression in others is observed. The crying of one child often induces crying in another, the sight of a sobbing mourner usually induces vague sorrow in many of us and the sight of a terror-stricken face strikes fear in our heart. When a dog's bark of anger is heard by other dogs their instinct of combat is aroused, and they come to the scene ready to fight. Similarly, when a bird cries out of fear and flies away, other birds take to flight.

Sympathy works among boys in the same way as it does among animals. McDougall explained the phenomenon as follows : Sympathy is aroused in one of the two ways either by an actual object of perception of that emotion in another individual. Sympathy is aroused on account of the similarity of body structure in members of the same species.

If sympathy is active, it becomes a vital force in social life. It knits us more closely with our fellowmen. Sympathy naturally leads to forgiveness and tolerance. Sympathy also develops into intelligent cooperation. Education should aim at its development. The mechanism of sympathy also deserves to be exploited by those who are anxious to reduce social distance between different groups. The teacher has to direct the expression of boys in such a way as to conduct a healthy social life and bring about happy social cohesion. The class should feel as one and

each individual should share the happiness and sorrow of his fellows.

Suggestion means a statement which a person accepts without any critical inquiry. When a person is inclined to believe uncritically another person's statement he is said to be suggestible. Children are more suggestible than adults. This is natural. Children have limited experience. Their critical powers too are not highly developed. Therefore, they do not subject to severe examination what adults tell them. Being aware of their own intellectual and physical inferiority, children invest their seniors with prestige of power and knowledge. Girls are more suggestible than boys in certain respects for they are brought up differently; their curiosity is not as much encouraged as that of boys and opportunities for exercising their intellectual abilities are also limited for them. This is true at least of a majority of girls. They are brought up in old fashioned ways. They perform the habit of acceptance and carry it over into their schools and colleges. Many of them carry this habit into the married life and consider the opinion of their husbands to be always true. Suggestions come from all persons. But the strongest suggestion comes from the mother, the play fellows, the father and the relatives. This due to the child's regard and affection.

Suggestion is at work in the child's training at home, in education and in every form of life. The child is suggestible to parents and teachers. This facilitates the process of the acquisition by it of the conventional attitudes and ideas of right and wrong or good and bad, and ideas about God and groups. Suggestion supplies the sanction behind the conventional code of morality. Deliberate training at home and the system of education depend on suggestion. Parents exploit the child's suggestibility to the prestige of members by telling him that every one does this and no one does that. In schools and colleges, many students uncritically believe in many things. In commerce, the advertiser repeats a prestige suggestion. Your favourite film star uses this soap and that cream. Indeed many people admire the Taj Mahal because so many have said that it is beautiful.

A teacher has to make use of all kinds of suggestions in teaching the class and maintaining discipline. Suggestion can be utilised for the good of the child. The child's thinking power is limited and it is to his own advantage that he naturally allows himself to be guided by the thoughts of others. We can utilise the power in suppressing the harmful tendencies of the child. It is of immense value in moral training. Good habits of conduct and valuable interests can be fixed through suggestion. It can be used in maintaining discipline in the school.

Imitation is defined as a form of suggestion wherein the

suggesting stimulus gives rise to an activity of like nature. The old and the young imitate. Fashions in dress, literature and behaviour spread on account of imitation. Moral and religious practices too become conventional on account of it. Imitation is essentially repetition. Child attempts to parrot the words and ape the actions of his elders. The successful ways of living discovered by a few are imitated by others and the behaviour of the previous generation is imitated by the next. When conditions of life change, new experiments in living are made, new ways of life are invented and they too spread through imitation.

The baby smiles when the mother smiles. It makes a weeping face when it sees a weeping face. According to Akolker, the following are the laws of imitation:

1. Imitation proceeds from the higher to the lower. Kings and queens become models for the aristocrats and the latter become models for commoners. City people are imitated by villagers in dress, in speech, manners, house keeping and decoration. Lower classes imitate the higher class.

2. Imitation proceeds from internal to the external. This means that people first imbibe the ideas and then actual behaviour is modified.

3. Modes of doing persist more obstinately than modes of thinking. The bridegroom still utters the oath in Sanskrit though he hardly understands the meaning.

4. Imitation spreads in geometrical progression. One individual is imitated by a few, a few by many and that way it goes on.

The child learns the conventional gestures, speech vocabulary, and many other useful activities through imitation. Conventional postures of prayer and acts of worship are imitated by children and remain with them throughout life.

Play : Play activity which is important for social development can be defined as the activity in which a person is engaged and when he is free to do what he wants to do. Play satisfies the individual's urge for freedom of action. Play is an expression of the creative activities of the child. It is marked by freedom and joy. Play is very necessary for the growth and perfection of the physical, social and mental powers of the child. Just as the poet cannot restrain himself from writing a poem, or a musician from singing, so too the child cannot restrain himself from play.

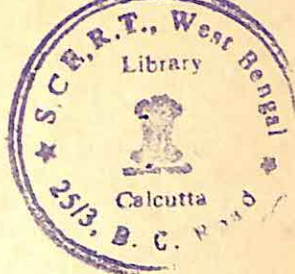
Fundamentally, play is any activity that is all absorbing, gives pleasure, represents some degree of creativeness. During childhood, play is more informal. With increase in age, play activities decrease in number, but there is increase in the specific

time devoted to a particular kind of play activity. The young child's chief business of life is play. This helps him in socialisation.

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EMOTIONAL DEVELOPMENT

THE complex study of emotions provides us with a view of the vital subjective influences in the child's life. We observe Sanjay's temper tantrum and contemplate the cause or purpose. We note that Neenu at one moment seems quite mature and secure and at another moment displays seemingly unrelated, immature and crying behaviour. Hence, one of the most difficult aspects of child life for the adult to comprehend is the area of emotional development. And it is in this area of emotions that the parent or teacher is frequently ineffective because of his own emotions and feelings. The adult who is either overly sensitive or excessively controlled has difficulty in developing empathy with the child's fluctuating emotional life, and hence difficulty in his interactions with the child.

What is emotional development? Is it reached at a specific point in time, or is emotional development subject to considerable intra-individual variability? The child who is apparently mature and balanced in his emotional life suddenly becomes upset, resorting to temperamental outbursts. Is emotional development cyclic, like other forms of development? How serious is thumbsucking, and biting, enuresis, and other tension outlets? What is the criterion of emotional maturity? What can the teacher do to help the child become more mature emotionally?¹ This chapter makes an attempt to answer these questions.

The word 'emotion' is derived from the Latin word 'emotus', the participle to *emovere*, to move or to be put in motion. The word 'emotion' is used in psychology to describe a state of excitement in the organism.² The emotion represents affective feeling tone. It is characterised by inner adjustment, conditioned by

1. Dinkmeyer C. Don, *Child Development. The Emerging Self*, Prentice-Hall Psychology Series, 1967, pp. 252.
2. Sandstrom, C.I., *The Psychology of Childhood and Adolescence*, London, Methuen and Co. Ltd., 1966, pp. 149.

the functioning of the autonomic nervous system and aroused by the interaction between an external stimulus situation and the inner mental status (Crow and Crow 1961). Webster's Dictionary (1963) defines an emotion as "the stirred-up state of the individual, as represented by a combination of factors". An individual is not born with set patterns of emotional behaviour. The attitudes and feelings of an individual at any given moment have a profound effect upon the way he may react to any given situation. In emotional states the entire body participates in the reactions that accompany the experience.

A particular stimulus may arouse an emotion at one time, but not at another, even though the stimulus conditions appear to be similar both times. A given stimulus may rouse different emotions at different times.

Interrelation of Physical and Emotional Factors

Just as physical well-being of the child is a primary factor in the quality of his physical growth, so his emotional well-being is a primary factor in his mental and personality development. The relationship is not only of physical factors upon physical growth and of emotional factors upon psychological growth. There is also a cross relationship: physical factors influence psychological growth and emotional factors influence physical growth.

In the same way that the physical environment of climate, food, rest, exercise, to strain and fatigue and to disease determine the rate and pattern of the child's physical growth, so the emotional climate, love or the lack of it, good or poor discipline, adequate or inadequate intellectual growth experiences, psychological strains or satisfaction, and other psychological factors, will determine the rate and pattern of his intellectual and personality growth.³

FUNDAMENTAL EMOTIONAL NEEDS

In understanding children it is important to recognise the significance of need theory. Fundamental needs are not only organic but include psychological needs which have developed during the process of socialisation and the emergence of self-individual needs of the child serve as the basis for his educational experience.⁴ Needs arise from the interaction of the child with his total psychological field. They are individualised and are as unique as the numerous situations which the child experiences. Snygg and Combs have attempted to define needs from a phenomenological point of view. They hypothesise one

3. John Gabriel, *Children Growing Up*, London University Press, 1969, p. 138.

4. Dinkmeyer C. Don, *Child Development*, op. cit.

basic need, which would encompass all of the varied human needs "for the maintenance and enhancement of the self."⁵

In this sense psychological needs arise in connection with the protection and development of the self. In education the teacher helps each child to become aware of his own needs, then utilises them in the motivational process. Discovering and defining his own needs can serve as the child's basis for educational progress.

Numerous lists of human or emotional needs have been developed. We shall discuss needs in terms of two primary areas—basic bodily needs and basic psychological needs.⁶

Basic Bodily Needs

The list of basic needs and of the goals which will satisfy them has been compiled by Young.⁷ They are as under:

1. Needs arise because of processes taking place within the body. The individual therefore:

- (a) seeks food and water to satisfy hunger and thirst;
- (b) seeks rest and sleep to avoid or reduce fatigue;
- (c) seeks to rid the body of waste products by excretory activities;
- (d) seeks a member of the opposite sex to satisfy sexual desires;
- (e) during bodily illness with high temperature and under conditions of heat, cold or lack of oxygen, the body automatically becomes active and perspires, shivers and gasps in an attempt to right the imbalance.

2. Needs arise because of stimulation by external subjects.

Resulting behaviour may broadly be divided into:

- (a) approach activities aimed to seek comfort and pleasurable stimulation;
- (b) withdrawing activities aimed to prevent discomfort and pain.

5. Comb, A. and Snygg, D., *Individual Behaviour*, Rev. ed. (New York Harper and Row, Publishers, Inc., 1959), p. 58.

6. Dinkmeyer C. Don, *Child Development*, op. cit.

7. Young, K., *Personallty af Adjustment*, Routledge and Kegan Paul, London, 1947.

3. Needs arise for physical activity and for expression of feeling. An individual satisfies such needs through:

- (a) random movement of the arms, legs, hands; gross activity of the whole body, as in running, climbing and swimming;
- (b) random vocalization, bodily movement; jumping and shouting in excitement or joy; slumping and weeping in sorrow.

The need for physical activity is probably greater in children than in adults and certainly children are less inhibited on expressing it. When they leave the classroom, it is difficult to get them to walk along the corridor on the way out to play. They cannot restrain the urge to fling their arms and legs about and to whoop with joy as soon as they are freed from the confines of the classroom. Sometimes we find it exhausting even to watch their careening about in the playground. Their restlessness before a Diwali or Holi ceremonies is difficult to suppress.

Some bodily requirements (such as oxygen, normal body temperature) are usually satisfied automatically; others (such as food, sex) presuppose a complex social organisation. Secondly, human beings develop appetites which are not needful to the organism. As the Roman epigrammatist, Martial, put it, 'man eats when he is not hungry, drinks when he is not thirsty, and makes love at all seasons. Thirdly, satisfaction of bodily appetites, particularly acquired tastes (tea, smoking), can indirectly satisfy psychological needs. Children who are deprived of affection often start eating a lot, especially sweet things and for a time they become quite fat. Adults who are anxious may also over-eat or smoke more than usual. Because of these complications, the division is by no means clear-cut⁸

Basic Psychological Needs

It is most easy to give a complete list of psychological needs and goals. Some psychologists have been content to list a few, others have listed fifty or more.⁹ The sixfold classification below is based on work of Maslow. It presents those needs which, Maslow would say, should be satisfied in order that a child may develop his personality to the full.

1. To experience a sense of union with other people (to belong);

8. Gabriel John, *Children Growing Up*, University of London Press, 1969, p. 10.

9. Maslow, A.H., *Motivation Personality*, Harper, New York, 1954.

2. To be secure;
3. To be independent of other people;
4. To adventure and to gain new experience;
5. To know, to construct, to create; and
6. To experience a sense of personal worth.

The major goals of two needs are to identify with other people and conservation—keeping things within the environment much the same. The goals of next three are separateness from other people and change—making the environment different in some way. The last, self-esteem is derivative in the sense that its satisfaction follows balanced satisfaction of the identity and conservation of the first two, and of the separateness and change of the other three, basic needs.¹⁰

1. To experience a sense of union with other people (to belong)

The child needs to be a part of the group and to feel both acceptance and identification. The tendency to become closely attached has been studied. In a controlled experiment, Schaffer and Emerson¹¹ traced the development of a baby's desire to be near to and recognised by others. Up to the age of about seven months, a baby will respond to a familiar person; when he is between twenty-eight and thirty-two weeks, his attachment becomes more specific, to members of family more especially to mother, with the tendency then to show some fear to the stranger. Their findings are similar to those of Ainsworth,¹² who studied twelve East African mother-and-baby pairs. They are also confirmed by Freedman's study¹³ of the gradual transformation of the baby's smile after the fifth month, 'from a universal response to all human faces to one reserved only for familiar persons.'

Human beings seek

- (a) To be with or in the presence of other people;
- (b) To be acknowledged individually by another person or persons;
- (c) To join in cooperatives with others; and

10. John Gabriel, op. cit.

11. Schafer, H.R. and Emerson, P., *The Development of Social Attachments in Infancy*, Monograph of the Society for Research in Child Development, 1964, 29, No. 3 (Serial No. 94).

12. Freedman, D.G., "The Infants Fear of Strangers and the Flight Response", *Journal of Psychology and Psychiatry*, 1961, 2, pp. 242-48.

13. Ainsworth, M., "The Development of Infant-mother Interaction among the Ganda" in Foss, B.M. (Ed.), *Determinants of Infant Behaviour II*, Methuen, London, 1963.

- (d) To have a specially close relationship with one person or with a few chosen persons.

2. To be secure : The child proceeds from the security provided by his mother to that provided by the family as a whole to that provided outside the family by companions and institutions. But the need for security implies a further step on the child's part, namely, to cope by himself with problems that give rise to anxiety or at least with some of the less difficult ones. Such 'coping' behaviour is illustrated by the following anecdote :

"A group of ten-year-old boys playing in a field come to a fast-flowing stream and decide to cross it. There are stepping stones set at varying distance apart and sometimes a jump is needed to go from one to another. All the boys cross except for one whom we call Michael. Michael gingerly steps on to the first stone, then back again; he stands immobile, unable to take another step, despite encouraging calls from his friends. Let us assume that his friends do not taunt Michael. They recross the stream, and all wander home. During the afternoon Michael is obsessed with the painful details of the accident. Suddenly he decides to go back to stream and try to cross it by himself. As he walks across the fields, his anxiety is shown by a slowing of his walk, his growing confidence by a determined hastening of his steps. The same alteration occurs when he reaches the stream. Yet he crosses slowly and carefully. He feels, competent and in his exhilaration gives a whoop of joy and runs jolly home."

Michael feels elated not only because he has mastered a difficult skill, but also because he has overcome his temerity. He has progressed from fear and anxiety to cautious activity and competence."

To be independent of other people

The child needs independence, recognition and self-direction. Each child needs to feel able to take responsibility. He wants to feel that he can make some decisions for himself. The level of decision is not immediately as important as the provision of increasing opportunities to make decisions as he grows and matures.¹⁴

To adventure and to gain new experience

This, like the need for independence, may at first appear to conflict with the need for security, but if there is too much security the individual becomes bored. He will then seek a novel situation the excitement of living—a dangerous sport to play, a

14. John Gabriel, *Children Growing Up*, London University Press.

new problem to solve, another detective story to read. Human beings not only want to reduce the strain of too many anxieties, but also to increase tension when life becomes too secure. As one psychologist has put it: 'Man desires both the fat of security and the pepper of insecurity.'¹⁵ Thus human beings seek (a) to court danger, (b) to tackle new tasks, (c) to adventure in new places.

To know, to construct, to create

Everyday observations and experiments with children have shown that they seek (a) to know and understand the nature of objects, people and events taking place around them, (b) to manipulate some parts of it and so use them for their own purposes, (c) seek to do something original with material and objects something that nobody has done before.

To experience a sense of personal worth

A human being desires:

To esteem himself, to feel confident;

To be held in esteem by others,

To feel that his work is useful, valuable and necessary.¹⁶

The Differentiation of the Emotions

There has been much discussion about how to describe the emotional life of a newborn baby. What content is to be attributed to it? Psychoanalysts and others closely associated with them have claimed that from the moment of birth—indeed, even before birth—human beings are capable of human experiences. Isaacs has maintained that knowledge and insight are lacking at birth, but that desire fear and anger, love and hate are present from the very beginning.¹⁷

A Developmental Theory of the Emotions

The view that emotional development depends chiefly on maturation process predetermined by heredity is held in particular by Gesell. However, the opinion that this development is due mainly to environmental factors has many advocates. It is pointed out, for example, that a snake let loose in the vicinity of a child does not arouse fear if the child is younger than two years. Children three years of age, on the other hand, show

15. Conze, E., *The Psychology of Mass Propaganda*.

16. John Gabriel, *Children Growing Up*, London University Press.

17. Dinkmeyer C., loc cit.

some caution, and from four years upwards they show an even greater inclination to keep at a distance.¹⁸

A prominent supporter of the environment theory, Harold Jones, has said:

As a child develops, his intelligence innately matures, and his perceptions become enriched through experience. New things startle him because of keener perception of the fact they are new and unusual...Fear arises when we know enough to recognise the potential danger in a stimulus, but have not advanced to the point of complete comprehension and control of the changing situation.

Emotional development is a product of both maturation and learnings. Gesell believed that emotions could be fully understood only in relationship to the total developmental pattern and the maturational effects. Since maturation was essential for the child's physiological and mental growth, it followed, he felt, that it was also a key to understanding emotional growth. Maturation, for instance, plays a significant role in influencing the development of intelligence in the child. It also affects his height, weight, strength and motor coordinations. All of these attributes have an effect on the child's self concept and his relationship with others.

Emotional development takes on a pattern as the child matures. Gesell developed a set of typical behaviour expectation and affective attitudes which accompany emotional maturing while these descriptions were linked to specific chronological ages, they are best understood as portraying the sequences of development.¹⁹

As the individual's growing capacities emerge, his emotional behaviour may change as an accompaniment of the total growth effect. For example, as the child increases in physical strength and intelligence, he may be less afraid of things which previously brought a fear response, the same situation may evoke a more pleasant response.

Emotional development proceeds from the relatively undifferentiated emotional responses of the infant up through what has been termed as emotional maturity. Bridges developed the schematic approach to understanding emotional development.²⁰

The figure (1) is from a study by Bridges, and is intended to give a survey of the approximate ages at which the different emotions first appear. The emotional content of the first month

18. Sandstrom, C.I., *The Psychology of Children and Adolescence*.

19. A. Gesell and F. Ilg, *Child Development* (New York: Harper and Row Publishers, Inc., 1949), pp. 289-91.

20. Dinkmeyer C. Don. loc. cit.

of life is designated 'excitement.' By this is meant specific reactions, even as responses to strong stimuli, cannot be detected during the first weeks, only very general and uncontrolled muscle reactions can be observed.²¹

During the first months distress and delight are differentiated, distress somewhat earlier than delight. Anger, disgust and fear appear at and between three and six months, and during the

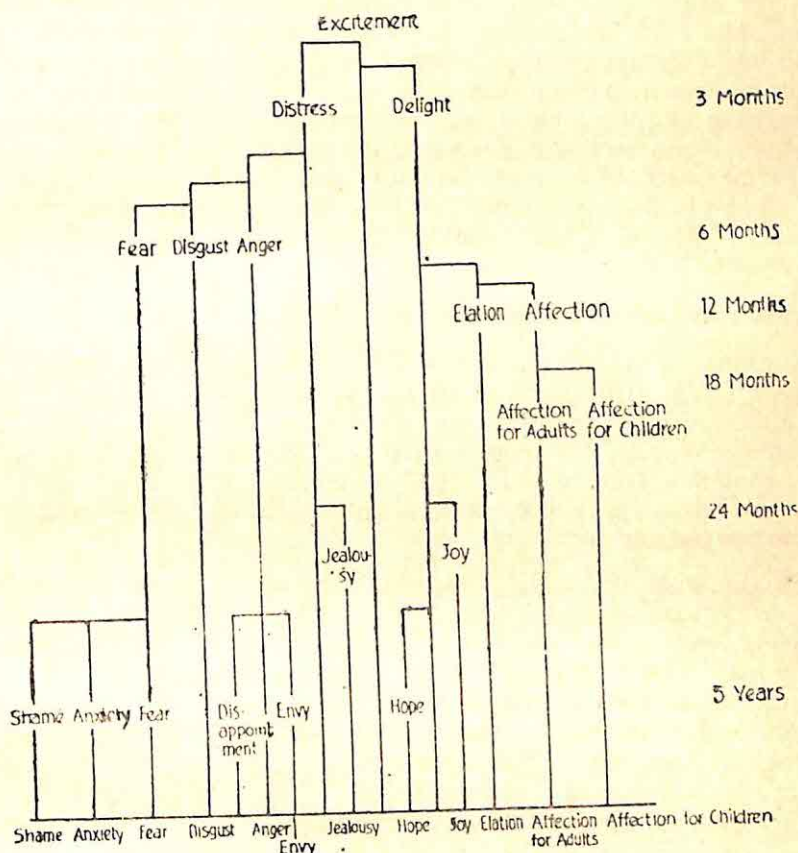


Figure 1

months around the first birthday delight splits up into satisfaction, and affection for grown-ups and children.

Data of this kind are naturally unreliable, owing to the lack of relevant measurement techniques and the fact that available observation methods leave the field open for subjective judgments. Others have considered that they could observe other emotions. Buhler adds anxiety and surprise in the seventh month, and

21. Sandstrom, C.I., *The Psychology of Childhood and Adolescence*, London, Methuen and Co. Ltd., 1967.

Goodenough, in her list of emotions shown by a ten-month-old child, includes obstinacy, dissatisfaction and anticipation. Lists of this kind easily lead to confusion because scientifically we do not know what we are talking about: a valid, reliable system of definition does not exist.

The child's emotions differ from an adult's. They are simple and spontaneous. Typically, the young child's emotions last a short time and then end, perhaps even abruptly. The young child may be quite intense in showing elation or fear, much more intense than is common in a more mature individual. Children's participation in events generally has a more emotional basis than adult's, children react subjectively to experiences, and their responses are frequently emotional. The child is not as able to conceal his true feelings and emotions as the adult. The child's feelings are more on the surface and his emotions can be detected by his appearance, tension or psychological movement.²²

Learned and Unlearned Expressions of Emotion

Studies of the abovementioned kind suggest strongly that many different expressions of emotions are largely learned. They can no longer be regarded as a number of primitive, natural patterns. Watson, the behaviourist, was one of the first to study this problem. He came to the conclusion that there are only three unrelated types of emotional expression, and they are related to fear, anger and love.

Sudden loss of boding equilibrium by the violent removal of a support or by a loud noise was regarded by Watson as always arousing fear, while anger was evoked if a child's freedom of movement was restricted. Love, in which term Watson like Freud, included sexuality, appears when a child's erogenous zones are touched, when a child is patted or fondled, or allowed to lie on its back in someone's lap.²³

Factors Predisposing Individual to Emotionality

Responsibility for the appearance of excessive disintegrated emotion rests with various factors, including physical condition and health, intelligence, social environment, and family relationship. The child who is affected by poor health and who is easily fatigued may exhibit excessive excitement or emotionality. Mothers frequently notice that when a child is off his usual eating or sleeping schedule he is more irritable.

Children who are more intelligent than the average tend to

22. Dinkmeyer C. Don, *Child Development*.

23. Sandstorm, C.I., *Child Development*.

have a broader perception of the world, which enables them to perceive and comprehend the great variety of emotions from the serious to the ridiculous, the tragic to the humorous and thus to participate in a wider range of emotions.²⁴ The child who comes from a continually tense social environment in which interpersonal pressures within the family and extreme disciplinary methods are utilised, tends to be more emotional.

The child who is spoiled, neglected or over-protected in the family tends to display inappropriate emotional behaviour.

The following factors cause childish emotionality:

1. Fatigue: Tired children are inevitably cross and difficult to manage. Fatigue studies have shown that the times of the day when young children are most likely to be tired are just before noon and evening meals, just before bed time, and just after some causal activity, such as shopping trip or a long automobile ride.

2. Poor Health: Good health is reflected in pleasant emotions, while poor health, like fatigue, makes a child cranky and irritable. When the child is very sick, emotional outbursts are relatively infrequent but, as the child convalesces, the tendency to irritability will increase. This, in turn, makes his care increasingly difficult.

3. Association with Emotional People: Little children are mimics. They quickly imitate the behaviour they observe in others. The more frequently and the more closely a child is associated with a person whose emotions are uncontrolled, the less likely he is to develop emotional control himself.

4. Thwarted Desires: All young children behave in a selfish manner. They do what they want to do when they want to do it, regardless of how much they may inconvenience others. Society, of course, imposes restraints upon the child's natural impulses. The child in turn, revolts. The stricter the discipline, the more disposed the child will be to revolt.

5. Unpreparedness: Many times situations for which the child is not prepared give rise to emotional outbursts. Perhaps the emotionality would not have occurred if the child had expected the situation. This fact has already been stressed in the case of fear. It is not the object itself that the child fears so much as the fact that it is presented to him suddenly and unexpectedly.²⁵

24. F. Holmes, "An Experimental Study of the Fears of Young Children", Eds. A. Jersild and F. Holmes, in *Children's Fears, Child Development*, Monograph 20, pp. 167-296.

25. Hurlock B. Elizabeth, *Child Growth and Development*, McGraw-Hill Inc., New York, 1966, pp. 166-168.

Emotional Maturity

Psychologists differ considerably in their emphasis on the role of maturation in the development of emotional behaviour. Gesell believed that maturation is responsible for the gradual evolution of emotional expression in infants and children. He strongly disagreed with the view that emotional development is largely a phenomenon of social stimulation. According to Gesell, maturation influences the expression of emotion through the development of capacities, rather than through the ripening of a specific, innate response pattern. Jones demonstrated that while visceral components of emotional response are not highly correlated with the vigour of vocal and motor components during the neonatal period, this correlation is increased in preschool children, indicating that the integration of various aspects of emotional development are dependent partially upon maturation.²⁶

For Gesell, as the individual becomes more adequate physically, intellectually, and socially through the development of his capacities, there is a concomitant emotional growth. Outside control gradually disappears as the child's emotions mature, and ultimately the emotionally mature individual is able to function on the basis of inner controls. In our culture growing up requires that the child behaves in a certain way, expresses his anger in a controlled manner, and learns a number of other culturally approved expressions of emotion. Thus, a considerable amount of our emotional behaviour is learned and related to a specific culture.

Emotional maturity is always relative. A five-year-old child has emotional maturity if he is capable of the emotional behaviour we judge fit for a five-year-old. Emotional maturity, however, develops throughout life. It is also a form of maturity from which one can regress most quickly. The child becomes more emotionally mature as the parent permits him to accept responsibilities and becomes independent and self-sufficient.²⁷

Jersild presents one of the most comprehensive lists of the stages involved in the child's moving toward maturity in the emotional area.²⁸

1. A change from being a creature who at first receives much, gives little, to one who is capable of giving as well as of receiving, and capable of learning to get enjoyment from giving.

2. Development of capacity to identify with a larger social group, and the ability to participate emotionally in the fortunes of the larger group.

26. *ibid.*

27. Dinkmeyer C. Don, *loc. cit.*

28. Jersild, A.T., *Child Psychology*.

3. Development from the status of being the child of family to the status ultimately, of being able to have children of one's own and along with this development a capacity to exercise the feeling and attitudes involved in being a parent psychologically, whether or not one is a parent biologically.

4. Progressive sexual development and the capacity after puberty to enjoying mature sex experiences.

5. An increased capacity for bearing the inevitable sufferings and pains connected with life and growth without feeling abused.

6. An increased capacity for sympathy and compassion as one assimilates the meaning for self and others of the joys and vicissitudes of life.

Emotional maturity, then, is not a state in which all problems are solved but, instead, is a continual process of clarification and evaluation, an attempt to integrate feeling, thinking and behaviour.²⁹

The Psychoanalytical Viewpoint

In spite of the pressure of environment and in spite of his own efforts, man is, throughout his life, the 'victim of his feelings'. The factors that promote or handicap progress towards a richer and more controlled emotional life have been discussed widely by child psychologists, and particularly by psychoanalysts. Psychoanalyst has focussed his attention on certain aspects of early training, for example, the effects of sudden or too early weaning, exaggerated demands on the early control of bowels and bladder.

A central part of psychoanalytic theory is that of infantile sexuality, that a child experiences sexual pleasure in various ways in the earliest periods of its life; and that the foundations of sexual disturbances and deviations, and therefore of the whole personality, may be laid down during the early stages of development, if the child's environment reacts mistakenly to its needs.³⁰

Significance of the Mother and the Role of Love in Human Development

For the adequate development of the child's emotional life he must feel loved. The amount of affection given to the child during the early years of life seems to be related to the kinds of relationship which he can eventually form with other

29. A. Jersild, "Emotional Development" in *Manual of Child Psychology*, ed. L. Carmichael (New York: John Wiley and Sons, Inc., 1954), pp. 861-62.

30. Sandstrom, I.C., *The Psychology of Childhood Adolescence*.

individuals. The mother, or the person who takes her place plays a fundamental role in this connection. A 'primary affection hunger' is often spoken of to stress the child's need of mother-love and other emotions contained in the mother-child relationship. A child shows early its need for human company, and the old view of the mother's significance in this respect is being confirmed all the time.

Research by Goldfarb and Spitz indicate that children institutionalized during infancy, who do not experience consistent 'mothering', become apathetic and socially unresponsive.³¹ They find out the importance of relatively consistent gratification from some person. Renee Spitz also tells of an experiment in a nursery and a foundling home. The nursery children were raised by their mothers; those on the foundling home were cared for by overworked personnel. Both institutions provided adequate food, medical attention, and housing. Results showed that the nursery children developed normally, but 37 per cent in the foundling home died during the two-year observation. The condition has been titled 'Marasmus', indicating that the child is completely starved for affective emotional interchange.³²

Affection shown to the child during his first years of life, then, is of extreme importance. One of the most important functions of the parent is to transmit a genuine feeling of love and concern. When the child feels a severe lack of affection he is often prone to such destructive tendencies as suspiciousness, fear and aggression.

The role of love and affection in the child's development is most significant. Being loved gives the child his basic security. When the child feels loved he is more able to accept himself and others. He no longer needs to reassure himself of his worth but is free to extend himself to others. His social interest is cultivated.

Being loved permits the child to identify with peers, parents, and the culture. Maslow believes that psychological health comes from being loved.³³ The self-actualized individual has both the power to love and ability to be loved.³⁴

The climate of feeling in the home provides the original source for child's development of self and his feelings of

31. Goldfarb, W., "Psychological Deprivation in Infancy and Subsequent Adjustment", *American Journal of Orthopsychology*, 15, (1945) 247-55 and R. Spitz, "Hospitalism: An Inquiry into the Genesis of Psychiatric Conditions" in *Early Childhood: Psychoanalytic Study of the Child*, I, (1945), 53-74.
32. Spitz, R., "Motherless Infants", *Child Development*, 20, (1949), 145-55.
33. Maslow, A., *Motivation and Personality*, (New York : Harper and Row, Publishers, Inc., 1954).
34. *ibid.*

adequacy. A climate of love enables the child to develop more adequate concepts of self, society and the world.

Symptoms of Unsatisfactory Emotional Development

How can the parent or teacher know when a specific child's emotional development is seriously retarded and needs special attention? The signs are not as definite and clear-cut as in the areas of physical and intellectual development; still sufficient clues are present to indicate that a child has special problems in regard to emotional maturity. Evidence is usually present when the child's emotional responses are out of context or away from reality of what one might expect in response to a given stimulus. Sanjay is far too angry; Neenu is much too fearful.

The teacher frequently is in a better position than the parent to detect emotional maladjustment. In the classroom he has a wide range of behaviour available through the actions of the children in a given chronological age range. The child who is deviant usually stands out.

If we keep in mind the basic needs and the developmental task of his age level, we can expect to note some symptoms of emotional maladjustment. Recognising that each child must accomplish the work tasks of life by taking up responsibility in the home and in the school and the social tasks of getting along with peer and significant adults provides a criterion for satisfactory emotional development.

Some of the more common symptoms of unsatisfactory emotional adjustment include resistance to learning, speech problems, excessive day dreaming, oversensitivity, extreme dependence on peers or adults, resistance to the requirements of the classroom or the group, temper tantrums, etc. The children produce this behaviour because they are not happy in themselves. Deviant behaviour is really a sign that child needs help.

TYPICAL EMOTIONS OF EARLY CHILDHOOD

Scientific studies of large groups of children have given us much important information about the emotions commonly experienced in the early childhood, what is responsible for arousing them, and how they express themselves. From this information we know what is the typical emotional behaviour in early childhood.

Knowing this will help to dispel the belief that the young child who becomes emotionally aroused and behaves in an unsocial way is a 'Problem child'. Furthermore, this information will

give clues as to when to expect different forms of emotional expression.³⁵

The emotional pattern of early childhood continues the process of changes which was found in infancy. These patterns, although showing some effects of maturation, are primarily acquired through learning. In fact, each of the patterns may be considered learned drives since they can motivate behaviour and their reduction can reinforce learning.

In discussing Development Theory of Emotions, it was indicated that Bridges found that there were two streams of emotional differentiations arising from the original state of excitement. One of these led through distress, the first to emerge, then to anger, disgust, fear, jealousy, shame, anxiety, disappointment and envy. Emotional patterns from this stream are unpleasant and disruptive emotional states. Out of excitement also emerged delight, and later, elation, affection for adults and children, joy, and hope. These emotional patterns are pleasant and integrative.³⁷

FEAR

From an early age all children are more or less troubled by fear, and some are so afraid that their freedom of action is seriously impaired. Adults too are often afraid, and many of them struggle with unresolved problems, that are rooted directly or indirectly in their childhood fears.³⁷

Human beings have more fears as little children than they have at any period of their entire lives. The child's fear disappears as his intelligence develops and he understands that many of the things he formerly feared are harmless and that there is no need to be afraid of them. With increased knowledge, as well as better reasoning, he also realises that many of the things that he feared might happen in early childhood would have done no harm.

Definition

Fear may be regarded as sentry and first line of defence for the organism. It obviously contains a large element of usefulness. But on the human level at least, and already during the early years, it is manifested in such an exaggerated way that it may appear as a threat to integrity and emotional well-being.

35. Hurlock B. Elizabeth, *Child Growth and Development* (New York), McGraw-Hill Company, Inc., (1956) pp. 158-164.
36. Watson I. Robert, *Psychology of the Child*, (New York, John Wiley and Sons, Inc).
37. Jersild I. Arthur, *Child Psychology*, (London, Staples Press 1957).

It is not enough to define fear as an emotional condition appearing when danger threatens; an organism fear may be aroused by stimuli that only hint at the possibility of danger. We may, perhaps, differentiate between fear and anxiety by saying that when fear is present there usually exists a clear idea of what the threat is, while an anxious person is often quite unable to explain to himself and others just what it is that makes him uneasy.³⁸

Hebb has said that development of the ability to think rationally runs parallel to development of the ability to act and think irrationally.

Causes of Fear

Numerous investigations have shown how causes of fear change with age. Most fears, however, are the aftermath of a frightening experience. The child who gets beyond his depth in water and has trouble getting back to safety is likely to build up a fear of water. Similarly, fear of high places can generally be traced to some unpleasant experience in a high place, such as climbing a tree and having trouble in getting down or nearly falling out of a window on the upper floor of a home.

However, it is not the thing itself that the child learns to fear but rather the way it is presented to him. Anything that occurs suddenly and unexpectedly without the child being prepared for it will give rise to fear. An animal that appears to be just as harmless as a stuffed joy may suddenly open its mouth and bark or roar. Or it may scratch with its paw. Because the child was not prepared for this, he is frightened.³⁹

Learned and Unlearned Elements: Hebb maintains that the fear of animals shown by children is only partly the result of conditioning. It should be regarded primarily as a means of reinforcing a response tendency in which psychological maturation is concerned. Such fears are not learned but they require that certain other learning has taken place. This learning comprises the perceptual development that has occurred through contact with the usual environment of the organism.⁴⁰

Common Childhood Fears

Common fears of young children include fear of animals, of being dropped, of being left alone, of falling, of insecurity, of

38. Sandstrom, C.I., *The Psychology of Childhood and Adolescence* (London, Methuen and Co. Ltd., 1967).

39. Hurlock B. Elizabeth, *Child Growth and Development*.

40. Hebb, D.O., "On the Nature of Fear," *Psychological Review*, 1946, 53, pp. 259-76.

footing (such as one experiences when walking on an icy pavement), of strangers, of loud noises—especially of the harsh, metallic sound—and of strange places.

In each instance the fear can be traced to the fact the child was not mentally adjusted or prepared for it. With each succeeding year, as the child becomes more mature intellectually, he can adjust himself more quickly to the sudden and unexpected. The result will be fewer fears.

Development Changes in Expressions of Fear

As might be expected on the basis of our knowledge of Bridges⁴¹ fear in later infancy is expressed in a global rather than a specific fashion. Crying along with general bodily distress characterises fear at this age. In older infants, fear resembles more what we would call a state of panic in adults.

Fear behaviour follows a fairly definite and clear-cut pattern in young children. It is characterised by an attempt to withdraw from the fear-arousing object. Before the baby can creep or crawl, he pulls his arms and legs up to his body, turns his head, and shuts his eyes. He behaves not unlike the turtle who hides in his shell. As the child's power of locomotion develops, he removes his body from the source of fear by crawling, then creeping, and finally by running.

As the children become older, fear responses become increasingly specific. With increasing maturity fear becomes more often expressed in a withdrawing from the fearful situation. The preschool child runs away, avoids fear-provoking situation, or when faced with such situation, uses verbal responses such as 'Take it away.'⁴²

Role of Maturation

The young infant is unaffected by many stimuli that will frighten him at a later time when his capacities for perception and discrimination have matured.

As the child matures, new things affect him by reason of his keener perceptions, and fear is likely to arise when the individual knows enough to recognise the potential danger in a situation but has not 'advanced to the point of a complete comprehension and control of the changing situation.' (Jones and Jones).

Maturation, that plays an important role in children's fear is brought about in the finding that a child who is precocious or

41. Bridges Katherine, M.B., *Social and Emotional Development of Pre-School Child*, London, Kegan Paul, 1931.

42. Watson I., Robert, *Psychology of the Child*.

advanced in his development may be afraid of events which do not disturb other children until they are older (Holmes). A bright two-year-old may, for example, show fear of a strange room or of a snake which does not disturb the child of average mental ability until later.

Role of Learning

Fears are also influenced by learning to an important degree. By virtue of a painful experience, or of having been startled or overwhelmed, a child may 'learn' to fear something which earlier did not disturb him.

The learning may be quite direct, specific, and restricted. A child is bowled over by a dog and later fears that dog. Again the effects may be more general. The child may fear not only the dog that hurt him but all dogs, perhaps, he may be on guard, as never before, whenever he sees any four-footed animal. Similarly, he may not only be afraid when he sees a dog but he may also be apprehensive when he passes the yard where he knows a dog is kept, even though no dog is in sight.⁴³

Persisting Fears

Although many fears wane and even seem to disappear, a large proportion of childhood fears persist in one form or another into adult years.

In a study of childhood fears as recalled by adults (Jersild and Holmes) it was found that in the case of 804 fears over 40 per cent still persisted into adult years. The finding in this study indicated that there is a large carry over of childhood fear into later years. Of the fears described in this particular study as 'still persisting' about 27 per cent were also described as being the 'most intense' fears recalled from childhood, and 28 per cent were described as being the 'earliest recalled' fears.

Among the fears that show the largest carry over into later years are fears of animals, of bodily harm through such dangers as fire, illness, drowning and of dangers associated with the supernatural, with the dark, and with being alone. Such continuing fears undoubtedly are a reflection of anxiety and insecurity in a person's life.

ANGER

The common emotion in childhood is anger. A young child finds himself in an environment regulated to suit the whims of adults. He rebels when his wishes are constantly thwarted.

43. Jersild T., Arthur, *Child Psychology* (London, Staples Press Ltd.).

whom his anxiety is a mask for considerable anger and aggression. Conversely, an apparently angry child may be found essentially to very frightened child.

This intimate relationship between fear and anger is useful in describing conflict in learning on the part of children. Dollard and Miller⁴⁹, for example, trace how fear becomes attached to anger. Anger on the part of the adult produces punishment, and hence the situation becomes one in which the fear of punishment may outweigh the anger.

JEALOUSY

Jealousy is closely related to anger in that the child is annoyed when he believes that his place in the affections of a loved one is being usurped by another. The most common cause of jealousy in the early childhood is the birth of a younger brother or sister whose helplessness requires time and attention from the different members of the household. Thus the situation in which jealousy is aroused usually is one in which other persons, objects, or conditions possess or share affection, honour or esteem which one desires for oneself. When a child is jealous it means that he feels threatened and is insecure; he does not have confidence in his own merit and worth, but he acts as though the attention or affection someone gives to another means that he is being denied.⁵⁰

When is jealousy most likely to occur? It is between the ages of two and five years. Before the age of two, the child's mental development is not advanced enough for him to realise that there has been a change in his relations with others, nor does he realise that he is now getting less attention that he formerly had.

From two to five, he is mentally old enough to recognise this change, but his comprehension is not developed enough for him to realise that it is caused by necessity arising from the helplessness of the new baby, not from lack of interest or affection on his parents part.

By the time the child is five years old, his interests broaden. He finds companionship among children of his own age. Since he no longer relies entirely upon adults for companionship, he does not wish so much as he formerly had the attention from and association with adults. The result is gradual waning of jealousy.⁵¹

49. Dollard, J. and Miller, N.E., *Personality and Psychotherapy: An Analysis in terms of Learning, Thinking and Culture*, New York, McGraw-Hill, 1950.

50. Jersild T. Arthur, *Child Psychology*.

51. Hurlock B. Elizabeth, *Child Growth and Development*.

Jealous Behaviour : Jealousy is not unlike a temper tantrum in that it is an unbridled expression of anger. It differs from a temper tantrum, however, in that it is always directed against another person, while anger is not. It characteristically consists of hurting, kicking, biting, pinching, or scratching.

Sometimes a jealous child reverts to infantile behaviour, such as bed-wetting, thumb sucking, refusal to eat, pretending to be ill, being afraid or helpless in carrying out tasks formerly carried out successfully. It sometimes shows itself in general naughtiness, in each case the child is bidding for attention.

Related Factors : It is likely that all siblings near each other in age will exhibit symptoms of jealousy at sometime or other, in one situation or another. When notably jealous children are singled out as a class for special study and compared with children who are not notably jealous, it was found by Foster a higher proportion of jealous children exhibited sleep disturbances, enuresis, habits of nail biting and thumb sucking, hyperactivity, destructiveness, and excessive demands for attention.

Studies of jealous children indicate that jealousy may occur both among the bright and dull. In one investigation, there was evidence that the duller of two siblings was more likely to be jealous, especially if he was older of the two (Smalley).

In one study it was observed that jealousy is likely to be less frequent when the age difference between two siblings is less than eighteen months or more than forty-two months (Sewall, 1930).

HAPPINESS

Healthy children are usually happy. This is true unless the environment is unfavourable and gives rise to unpleasant emotions. When the young child is in a good physical condition, it takes relatively little to get a happy response from him.

Studies of young children shows that the usual stimuli to happiness include the following: being smiled at, played with, tickled, patted in approval or in love by another person; receiving expression of friendliness from a pet animal; hearing unusual sounds; seeing funny faces; watching the sudden appearance or disappearance of a person or toy; experiencing slight calamities, such as slipping or bumping into a person and imitating or watching adults imitate others, especially their speech and gait.

Expressions of Happiness : Happiness is expressed mostly by smiling to laughing. When children are very happy, they make a lot of noise as they laugh. They open their mouths wide and literally roar. In addition to this source of noise, they frequently clap their hands and jump up and down.

It is not unusual for them to hug the persons or thing that arouses to their happiness. Many young children, after several minutes of uproarious laughter, fall on the floor and roll back and forth like little puppies. Then from sheer physical exhaustion they lie motionless and pant for breath.⁵²

AFFECTION

The child at an early age displays a desire to receive and an impulse to bestow affection. There are differences in interpretation concerning the origin of love. There is the view that the child's need for affection is an outgrowth of his helplessness. Again, there is a view that the child's love for a person or thing is a conditioned response. He loves his mother because he loves his milk.

Affection is similar to happiness in that it brings about a happy response. There is no evidence, however, to show that a child has natural affection for anyone.

Affection is an emotional reaction directed towards a person, an animal, or a thing. It indicates warm regard, friendliness, sympathy, or helplessness and it may take a physical or verbal form. A child's affection for others appears spontaneously and is aroused by a minimum of social stimulation. Learning plays an important role in determining the particular person or objects to which the child's affection becomes attached. The child tends to like most those who like him and are 'friendly' in their relationship with him.⁵³ In such a reciprocal relationship, the empathic complex, there is an emotional linkage between the child and significant people in his environment.⁵⁴

Because affection is conditioned by pleasant experiences with a particular person, the little child learns to have affection for those who take care of his bodily needs, who play with him and who are responsible for giving him pleasure and satisfaction. The child's affection is concentrated on those who give him an opportunity to express his love for them. Thus his affection for different members of the faculty as well as for those who have no blood tie with him will depend on the way they treat him, whether his association with them are pleasurable, and whether they meet his needs. The child's affections develop primarily in relation to people and only secondarily in relation

52. Hurlock B. Elizabeth, *Child Growth and Development*.

53. Keislar, E.R., "Experimental Development of 'like' and 'dislikes' of others among Adolescent Girls", *Child Development*, 1961, 32, 59-66. Walter, J.B. Pearce and L. Dahurs, *Child Development*, 1957, 28, 15-26.

54. Bossard, J.H.S. and E.S. Boll, *Child Development*, 1957, 59, 1-7.

55. Bauham, K.M., "Senescence and Emotions", *A Genetic Theory*, J. Genet, Psychol, 1951, 78, 175-183.

to animals and inanimate objects. Animals and inanimate 'love objects' are used as substitutes for a human object of affection.⁵⁵

Stimuli to Affection: Studies of babies and young children have revealed that there is a pattern in the types of stimuli that call forth affection. A baby under five months of age expresses affection indiscriminately for all who approach him in a friendly manner. As early as six months, however, he shows affection for a particular person or persons within the family circle. During the second half of the first year, he behaves affectionately towards familiar people but with fear toward strangers. During the second year, he includes *himself, his toys, and other possessions in the affection.*

Around the fourth year, the child's emotional dependence on the family gives way, in part, to emotional dependence on children and adults outside home. He regards these people as 'friends' who recognise him as an individual; who show interest in or affection for him; and who make his contacts pleasant with him. Even before childhood is over, the child may become romantically attached to a member of the opposite sex in his peer group, though his affection is generally concentrated in members of his own sex.⁵⁶ Throughout childhood affectionate behaviour develops along the child's social contacts. The more people he comes in contact with and the more pleasurable these contacts are, the more people he has affection for.⁵⁷

Affectionate Responses: Just as the stimulus that gives rise to affection follows a predictable pattern, so does the form of affectionate responses. Affection is first shown in an outgoing, striving, approaching kind of behaviours. Babies under five months of age fix their gaze on a person's face, kick, hold out and wave their arms, try to raise their bodies, smile and turn their trunks. By the sixth month, the baby has enough control over arm movements to reach the loved one. At this age he begins to respond reciprocally to cuddling by reaching for the loved one's face and by mouth fondling.⁵⁸

After the first year the young child shows his affection for others in much the same uncontrolled manner as he expresses other emotions; he hugs, pats, strikes, and kisses the loved person or object. Kissing is a less frequent expression of affection

56. Gold, M., "Suicide and Socialization of Aggression," *Amer. J. Social.*, 1958, 63, 651-661.

57. Harriss, D.B., and Tseng, S.C., "Children's Attitudes toward Peer and Parents as revealed by Sentence Completions," *Child Development*, 1957, 28, 401-411.

58. Jersild, A.T., "In Search of Self," New York, *Teacher's College*, Columbia University, 1952.

in young children than hugging or patting, though young children like to be kissed by others.

After the child enters school, he is likely to feel that demonstrations of affection are 'childish' and to be embarrassed by them. He then shows his affection for members of the family and friends by wanting to be with them. As long as his parents show a genuine interest in him, his interests, and his activities, he is satisfied that they love him. He in turn, shows his affection for them by wanting to be with them, to do things with them and to come with his problems.⁵⁹

ANXIETY

Worries, when frequent and intense, may lead to anxiety, a "painful uneasiness of mind concerning impending or anticipated ill."⁶⁰ Anxiety is characterised by apprehension, uneasiness, and foreboding from which the individual cannot escape; it is accompanied by feeling of helplessness because the anxious person feels blocked and unable to find a solution for his problem.⁶¹ Though anxiety develops from fear and worry, it is distinguished from them in several aspects. It is more vague than fear. Unlike fear, it does not come from a present situation, one from an anticipated one. The anxious child is often unaware of the cause of his anxiety.

Anxiety is due to imaginary rather than real causes. The causes are often irrational. Anxiety is a generalized emotional state. Anxiety comes from a subjected problem.⁶²

Anxiety depends upon the ability to imagine something not present. It frequently develops after a period of intense worry. Too many and too frequent worries tend to undermine the child's confidence and to predispose him to a generalised feeling of inadequacy which often leads to anxiety. Anxiety tends to increase during childhood, especially from the fourth to the sixth school years.

Anxiety varies from one child to another, both in quantity and quality. Girls, on the whole, tend to experience greater anxiety than boys.⁶³ Children who are unpopular experience

59. Koch, H.L., "The relation of certain formal attitudes of Siblings to Attitudes held toward each other and toward their Parents." Monograph, *Child Development*, 1960, 25, No. 4.
60. Jersild, A.T., *Emotional Development, Child Psychology*, 4th Edition, London, Staples Press Ltd.
61. Shaffer, L.F. and E.J. Shoben, *The Psychology of Adjustment*, 2nd Ed., Boston, Houghton Mifflin, 1956.
62. Jersild, A.J. loc. cit.
63. Senason, S.B.K. Davidsen and F. Loghthall, "Classroom Observation of High and Low Anxious Children", *Child Development*, 1958, 29, 287-295.

greater anxiety than do popular children. The less successful the child is in whatever he undertakes, the more likely he is to be anxious.⁶⁴ The less secure the child feels of his abilities to cope with the problems that face him, the more likely it is that specific worries will lead to a generalized state of anxiety, which predisposes the child to be anxious to any situation in which there is a threat to his security.⁶⁵

Characteristic Responses of Anxiety

The behaviour characteristically associated with anxiety is very similar to that connected with worry. The child who is worried or anxious may keep his concerns to himself, brooding over them and often intensifying them.

The anxious child may go to sleep even though he is not tired, he may keep himself too busy to think, or he may withdraw into a fantasy world or revert to infantile forms of behaviour.

The actions of a highly anxious child and his concern over apparently trivial matters may seem irrational, and the child himself may be at a loss to understand his behaviour. As Jersild has said, "One of the marks of an anxious person is that he tends to overdo or to underdo. A slight criticism may send him into a rage, or he may have what seems like an excess of calm when there really is something to get emotional about, as though he were under duress to put a tight lid in his feelings." The anxious child often behaves in a manner completely "out of character". An otherwise friendly child might show streaks of cruelty, or "the best boy in the town" may commit a brutal act that no one can understand.⁶⁶

Shaffer and Shoben have explained this seemingly irrational behaviour thus: "there is no specific effective adjustment to anxiety. When you are anxious, you are merely stirred up, unhappy, and driven to do something when there is really little to do. Anxiety is therefore primary evidence of a lack of adjustment."⁶⁷

Characteristics of Children's Emotions

The emotions of young children differ markedly from those of adolescents and adults. They even differ from those of old children. Unless these differences are recognised, adults will

64. Senason, I.G., "Test Anxiety, General Anxiety, and Intellectual Performance" *J. Consult. Psychol.*, 1957, 21, 485-490.

65. Lipsitt, L.P., *Child Development*, 1958, 463-472.

66. Jersild, A.T., *Child Psychology*, 4th Edition, 1957.

67. Shaffer, L.F., and Shoben, E.J., *The Psychology of Adjustment*, 2nd Edition, Boston, Houghton Mifflin 1956.

tend to regard the child's emotional reactions as "immature". Since learning plays such an important role in emotional development, it is illogical to expect all children of a given age to have similar emotional patterns. Individual differences are inevitable because of differences in maturational levels and learning opportunities.

Regardless of individual differences, however, there are certain characteristic features of children's emotions which make them different from those of adults or even of adolescents. These characteristics are as follows:⁶⁸

1. *Children's emotions are brief*: Typically, the young child's emotions last only a few minutes and then end abruptly. Because the child expresses his emotions in overt-actions, he "clears his system" quickly. As he grows older, social restraints on over-responses lead to "moods", which are expressed in long, drawn-out responses rather than in short abrupt outbursts.⁶⁹

2. *Children's emotions are intense*: The young child's emotional outbursts are characterised by an intensity seldom observed in an adult. His emotional responses lack gradations of intensity seldom observed in an adult. Fear, anger, and joy are all expressed in pronounced overt responses. Even the pre-adolescent child reacts with intense emotions to what appear, to an adult to be trivial frustration or matter of minor concern.⁷⁰

3. *Children's emotions are transitory*: The young child's rapid shift from laughter to fears, from anger to smiles, or from jealousy to affection are incomprehensible to many adults. These rapid shifts are attributed to three factors:

- (a) The young child expresses his emotions in an unreserved manner.
- (b) He lacks complete understanding of situation because of his immature intellectual development.
- (c) He has a short attention span, which makes it possible for him to be diverted easily.⁷¹

4. *Children's emotions appear frequently*: Children display their emotions more frequently, on the average, than the typical adult. As the child grows he learns to adjust to emotion arousing situations and to react to them in more acceptable ways.

68. Hurlock B. Elizabeth, *Child Development*, New York, McGraw-Hill Inc., 4th Edition (1964).

69. Merry, F.K. and Merry, R.V., *The First Two Decades of Life*, 2nd Edition, New York, Harper and Row, 1958.

70. Gessel, A.F.L. Ilg, and Ames, L.B., *Youth: The Years from Ten to Sixteen*, New York, Harper and Row, 1958.

71. Bousfield, W.A., and Arbison, W.D., "Autogenesis of Emotional Behaviour," *Psychological Review*, 1952, 59, 1-7.

5. *Children's emotional responses are different* : Observations of children of different ages show that there is wide variability in their emotional responses. Among all new born infants, the patterns of response are similar. Gradually, however, as the influences of learning and environment are felt, the behaviour accompanying the different emotions is individualised.

6. *Emotions can be detected by symptoms of behaviour* : An adult is generally able to control his feelings and emotions so well that it is difficult for others to know just how he feels. It is not so with children. Even though they may not show their emotional reactions directly in behaviour related to the way they feel, their emotionality can be detected by tension, restlessness, fidgeting, day dreaming, nail biting, thumb sucking, etc.⁷²

7. *Emotions change in strength* : Emotions that are very strong at certain ages wane in strength as the child grows older. Others, formerly weak, become strong. For example, little children show marked timidity in the presence of strangers. Later when they realize there is nothing to be afraid of, their timidity wanes.

8. *Patterns of emotional expression change* : The little child wants what he wants when he wants it. He does not stop to consider whether this will be harmful to him or to others. By the time the childhood days are over, the individual knows that social approval is dependent upon the degree of control he is able to exert over the expression of his emotions.⁷³

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MOTIVATION OF BEHAVIOUR AND NEEDS

PROBLEMS of motivation are a very important subject in educational psychology. Learning or perceptual processes are very much related to motivational process and its principles. The knowledge about process and nature of motivation on the part of teachers and parents will enable them to control the behaviour of pupils and wards respectively in an effective manner. This understanding is necessary because human organism is a complex system and this understanding will enable us to understand complexities of behaviour in a better fashion. Changes in human behaviour can be easily brought if mechanisms of motivation are fully understood. Studying of motivation has, therefore, significant importance for everyone who is interested in human beings.

Motivation is a dynamic and purposive process. It is a positive process. Activity or behaviour in life cannot be ensured satisfactorily in the absence of an adequate environment if it is not properly charged with motivation. Conflicts and frustrations are a part of motivational process and they form inevitable units of social environment. They generate affective disturbances in a human being and affect his pattern of life and sources of thinking. Motivation is, therefore, instrumental in a behaviour process. Identification of motivational properties of human behaviour have to be fully grasped in order to serve organism better and on proper considerations.

Motivation of behaviour is the crux of human problem as all behaviour stages of life in human beings. It includes a wide set of factors which try to stir up various drives and hungers in human beings. Without proper motivational level, the actual conception and scope of behaviour in human beings is difficult to comprehend. Sympathetic and adequate attention to the underlying mechanisms and principles, which induce persons and individuals to strive and act, cannot be obtained without proper evaluation of the theory of motivation. The present-day behaviour in society has become all the more motivation-oriented. Achievement motivation has become

to develop various models on the theory of motivation and each model has tried to represent a major view in its own prominent way. Since it is not possible to describe all the theories in detail, some of the important theories of motivation are stated briefly below:

(1) Biological Motives and Motivation

Biological and instinctive theory on motivation has been advanced long time ago. The history of the instinctual concept of motivation is ancient and in early years, this psychological thinking had dominated the field of psychology for quite some time. The advocates of this theory are called instinctivists. However, the inadequacy of this theory was soon discovered and new concepts and notions like drive, reflex, habit and native response were introduced. Experimentalists in psychology were not happy with instinct theory. This unhappiness, among other things, was due to the fact that 'instinctive' behaviour had several thousand sources of arousal in human beings. McDougall used instincts in a classical concept. Biologists also used the term in their own manner. Instinctive activity was supposed to involve many arousal behaviours. By way of definition, the instinct was considered as an inherited, specific, stereo-typed pattern of behaviour which was said to have its own energy and is released, rather than guided by particular environmental stimuli. The school of thought advocated that the most elementary form of energy mobilisation arose from definite biological needs of the organism. Conditions in human bodies like hunger, thirst and escape from pain give rise to motivated behaviour. Biological motives involve internal conditions in the individual. Instincts basically involve certain basic wants, needs and biological motives in a human system.

The intensity of an instinctive or a biological motive is expected to enhance with time. Extensive and prolonged absence, deprivation of instincts and biological needs may develop state of restlessness or disturbance in a person and it may create conditions that will disturb the minor physiological homeostasis in the person. In order to preserve the essential equilibrium in the body, human behaviour is likely to develop a certain sequence. According to this principle an active urge will start in the human beings which will compel them to mobilize their energy so as to restore inner equilibrium and this activity will persist till equilibrium is reestablished in the body.

(2) Emotion and Motivation

Although psychologists have defined emotion in various ways, it is undoubtedly very clear that emotional processes are basic to motivational behaviour. The psychologists who have given hedonistic interpretation to emotions are Young,

McClelland and Helen Peak. All of them have used affect as an important aspect of theory of motivation. According to Young, motivational states as sustained in animals and human beings by palatability and affect of the situation. His theory of motivation underlines the tension as the basis of drive which organises or disorganises behaviour. McClelland and associates emphasize the need for achievement and other needs in human beings as pivotal to motivational behaviour. According to this theory, all motives are treated as acquired and can be learnt. McClelland has defined a motive as "a strong affective association, characterized by an anticipating goal reaction and based on part association of certain cues with pleasure or pain." This theory conceives affective processes as fundamental to motivation. It asserts that direction, not arousal, of behaviour is to be the proper function of motivation. This system treats motives in terms of the expectations and secondarily in terms of the results of action. McClelland regards all motives as learned approach-avoidance tendencies.

Hedonistic theories of motivation underline the role of emotion and feelings as sources that organize, direct and energise behaviour. Motives may cultivate approach-avoidance tendencies. Unpleasantness will induce approach tendency. Peak, another hedonist, uses affect as a force that gives direction to behaviour and this direction may not be necessarily motivational in form.

Emotion is also considered to affect behaviour of a person and motivate him in a variety of ways. Although a human being inherits bodily structures, glands and a nervous system which to a certain extent determine his emotional behaviour and his personality, it is gainsaid that other behaviour tendencies like timidity, fear, aggressiveness or excitability can also be fostered by environmental conditions. Reactions of fear, love and energy can motivate behaviour in many ways. Learning to be afraid, fearful, or happy can be acquired and these reactions can be transferable to other situations. Functionally acquired fears can inhibit or retard behaviour or may give various complexes to a person by way of generating worries and anxieties in him.

Within the context of motivational theory based on emotions, the role played by frustration, conflict and stress in motivating a person cannot be ignored. Extreme conditions in environment may activate or depress a person. They may generate a series of physiological, psychological, social and related behaviour actions in human beings. Behaviour can be motivated by a frustrating condition in the environment. If a person fails to materialize his ambition, he will become more activated and will be motivated to try again and again depending on the degree of fascination that he has for the object. His repeated attempts will depend on his frustration-tolerance level. Chronic and prolonged frustration is also liable to break him down. Similarly, presence of conflict in a person has

motivational elements. Conflict can be temporary or situational or they may be permanent. It may activate progress or it may retard progress by producing barriers before goals. Sources of frustration and conflict can serve as strong drives in persons.

The emotional states, which are characterised by such attributes like frustration, conflict, stress, can promote or impede human activities. They may contribute and arouse a variety of responses in human beings and they, in turn will develop tendencies in behaviour which can be motivational in behaviour. Any system of motivational theory cannot ignore their influence in affecting psychological growth and development in a person.

(3) Social Motives in Motivational Theory

Some psychologists have explained motivation theory on the basis of social motives. The theorists feel that people are not driven by biological needs alone. Hunger and thirst are not the only bases of activating a person. They also assert that emotions alone do not activate a human being always. In a human life, social values play a considerable role in arousing energy and directing a person to behave in a particular way. It is asserted by them that social values play an important part in behaviour. Social motives in human beings are treated as sources of activity in human beings. In this context, the values and incentives may be formed in terms of rewards, or praise or it may be administered in terms of praise. Knowledge of results and overall performance may also release motivational state in a person. Type and nature of motives may also set up level of social aspiration in a person. Varieties of motives may influence the behaviour of persons. Motives are determined by the quality of home and the culture in which a person lives. Vocational needs, cultural aspirations and religious inclinations also may constitute essential ingredients of social motives. A particular person will become devoted to any one of the aforesaid motives depending upon his needs, values and philosophy of life. Beliefs will also determine his attitudes which can consequently influence his behaviour. Since the type and quality of motives can be large in number, they will vary from country to country and society to society in which a person lives. However, there are certain general motives which can influence people's behaviour irrespective of class, culture and society in which he lives. Among such motives, acquisitiveness is one of them. A person strives to acquire more and more wealth or more and more property.

Another social motive, which dominates the life of a person is the love for his country. It is generally expressed in terms of patriotic feelings towards his country. It may associate itself with such feelings as national security, dedication and love for the country. This motive exerts strong influence in the lives of people who try to identify themselves with the values and aspirations of the country.

A national leader can also give direction to this social motive. Development of patriotism is a psychological and educational process. It is the feeling of love from persons towards nation in general. Feelings of patriotism may also generate aggression if this motive is thwarted or locked. Similarly, religious, cultural and social motives can equally be strong factors in motivating a person as is the case with patriotism. In all these motives, there is identification with the ideal or ideals and there is general mobilization of energy of a person towards this end. Goal and ideology are set by the person and the perception and realisation of them become the main concern of his achievement and aspiration.

(4) Psychoanalytical Motivation Theory

Psychoanalytical theory, advanced by Freud, has also been used to explain motivational behaviour among individuals. Freud developed his theory of psychoanalysis on the basis of study of mental cases. He derived his inspiration partly from Darwinian theory of evolution of species. It gives, in a sense, emphasis on biological needs and environmental conditions in which a person lives. One of the bases of this motivation theory is the importance that is given to the unconscious. The nature of the unconscious part of the mind of the person has been elaborately described by Freud. He assumed that the vast part of the mental process is in the unconscious portion. In this assumption, he believed that the behaviour is caused through unconscious strings. He also assumed that all behaviour is to a considerable extent, determined by unconscious processes. These processes gave motivational import to the behaviour of persons in their own fashion.

Energy provided to the motivational behaviour in persons, according to psychoanalytical theory of motivation is provided by psychic energy. This energy is drawn from the libido. Its source is also attributed to metabolic energy. Sometimes it is also associated with nervous energy. There were other implications applied to this energy. But Freud was not very explicit about its real import and at the same time he did not give any mystical or supernatural significance to it. He felt that it was only vitalistic in form.

Psychoanalytical theory of motivation draws, inspiration from biological and instinctive force of human system. Instincts are treated as a type of inner force which sustains life. It may have both bodily and clinical manifestations. Human system has motivational characteristic, and that being so, instincts seek for gratification and hence, instincts are, according to Freud, the sources of all activity in a human being.

Psychoanalytical theory, has, among other concepts, emphasised two basic instincts which constantly influence a person. The two instincts are : the life instinct and the death instinct. Life instinct works in the *preservation* of life and death instinct in the *destruction*

of life. *Preservation* also leads to reproductive activities and to preservation of life. Death instinct involves destructive instincts in which aggression becomes part of this energy. There is, however, close relation between the two courses of energy and mind is a constant process of adjustment.

Psychoanalytical theory also emphasises that behaviour is psychodynamic and purposive in nature. It has sense of fulfilment. Mental processes like perceiving, judging, generalising and *activities* are determined by this dynamic process. The organism, therefore, is original in its demands and decides and selects things for itself depending on the *inner* needs and compulsions of the person. The effectiveness of action will depend on the quality of energy available. The higher levels of functioning in the human beings are also determined by this level of dynamism. Mental mechanisms like identification, displacement and sublimation become part of determining *progress* in human behaviour.

Adler and Jung who also belonged to this category of class of psychoanalysis initially, later developed their own respective schools and gave different explanations to the mechanism of human behaviour and motivation.

It would be, however, fit to remark that psychoanalytical theory of motivation has definitely contributed in explaining certain important aspects of human motivation. It has not definitely exhausted the whole truth about it. This fact has to be kept in view without losing sight of essentials on the theory.

A Critical View of the Theories of Motivation

It would be pertinent to remark that the foregoing theories on motivation have their own merits and they may be valid in their own respective ways but they are not adequate all by themselves. Each of the motivational theory has made contribution of its own but it would be unjustified to overlook the contributions made by other theories. Concepts like drive, needs, motives, emotions, etc., have their own use in explaining motivational behaviour but they cannot explain everything about human motivation. Similarly, social motives and unconscious process may have to say about motivational behaviour among human beings but those explanations are not the last words on motivational process. This position has to be fully realised so that one does not take a partisan view on any one of the theory given above.

Motivation is a very important determinant in human behaviour. The understanding of these determinants is very essential so that it is possible to evaluate behaviour in an objective manner. Enquiry into the role of motivation is essential in order to understand the invigorating mechanism in human beings. Motivation theory cannot be without utility. It has to reinforce and provide some fundamental interpretation about basic nature of human energies. Since

motivation is a central topic in psychology and education, its fuller meaning and grasp has to be fully understood. It is this reason due to which sufficient attention has been given by scientists and researchers on understanding this aspect of behaviour. While one cannot quarrel with concepts *used for motivation* one should not be in a mood to overdo things and support one school of motivation at the expense of the other. The precaution has to be kept in view and it has to be studied in a scientific way.

Factors Affecting Motivation

As motivation is a complex process factors that can motivate the behaviour in a person can be many. Many research studies have been undertaken to examine this problem scientifically. Results from such studies are diverse. In the background of those diverse results, it is necessary to have dispassionate, careful understanding on essential factors that affect motivation in human beings as without such an attitude one is liable to be carried out by many biases and influences on the subject. Organisms have their own ways of reacting to various stimuli and responses of an organism may be different to the same situation from time to time. These difficulties are bound to exist in view of the complex nervous system that human beings have inherited. However, in spite of difficulties stated above, it is not out of the way to identify some of the prominent factors that arouse motivational state in a human being.

Goals affect motivation. Goals may vary from person to person and the intensity to reach goal may vary from time to time in the same person or from person to person. It is very difficult to establish a well-confirmed empirical law on the relation of goals to human motivation. Even speculation about the subject may be difficult to make. Goals may be aroused about in accordance to one's needs, drive and aspirations that an individual acts for him. And since behaviour is molar in nature, the process of motivation may become integrative in character. Similarly, motivational behaviour can restrict goals only for sometime and later the behaviour may work independently of the goal. *A man may set his goal to become rich. After he has become rich, he continues to hoard money although his original goal of becoming rich was reached.* Allport has explained this phenomenon in terms of autonomy of motives. It may be said that any goal that appeals to man, may arouse him and cause his behaviour to get motivated. Goals will vary and they have no end.

Incentives may also motivate the behaviour of an organism. Incentives of all types may influence behaviour and motivate the person to work. A person may have abilities and those abilities he may employ as tools to fulfil his ambitions but incentives will determine the extent to which he gets motivated towards the work. Incentives try to change, as has been found, the capacity of a person to work. By virtue of better incentives, the level and amount

of effort in the person will increase or decrease. Incentives can be tangible as well as intangible. A praise from teacher may serve as an incentive for a student and for a worker, better wages may prompt him to work more. Similarly, incentives may be given in various forms and shapes. They may fall in the category of biological, social or ideological spheres. Other incentives like better income, better home, better social group and better opportunities for promotion may also motivate persons in various ways. The categories of incentives, which can have influence on the behaviour of an individual and motivate him may be diverse and large. Participation in work depends on the quality of incentives offered to a person.

Vim and vigour in a human being can also be increased by teachers, parents, friends and members. The quality of influence on a person by them will depend on the type of attitudes that the aforesaid influences will show towards him. The attitudes, values, personality and understanding on the part of elders can serve as motivating agents for a person. These conditions and encouragements in the environment will foster habits, abilities and interests in him which can score as incentives for him. Elders may develop and encourage curiosity and goal seeking behaviour which may activate the person to learn, explore or initiate. These persons may serve as mediums that will arouse behaviour and activity in them. It is generally seen that caretakers, feeders, presidents, tutors, mentors, etc., have influenced and affected behaviour in human beings in a variety of ways in the history of human civilisation.

Mobilising the will-to-work is another factor that affects motivation. The human resources can be geared up to top efficiency through proper level of will on the part of the workers and the people. Proper volition will also affect the capacity to work. It will also affect the drive to work more. Morale can affect the motivation. Morale can give an attitude in a person towards the work and the quality will determine the motivation in a person or of an organization. A good morale will also increase the willingness in a person to strive for the goal. Morale will provide a sense of feeling and well-being which is so essential not only for energy and enthusiasm but also for self-discipline. Morale can also stimulate feeling of "togetherness" which can work as an assertion in a big organization. Employee morale is important for reducing industrial conflict. Morale increases capacity for making an effort and it gives a boost to the philosophy and psychology of a worker. These conditions affect motivation.

The quality of environment, in which a person lives and works, may serve as an important source of motivation. If environment is stimulating, a person can acquire dynamic living, growing, developing and maturing personality. It will foster maturation and well-being in the individual and this state is psychologically a motivating state for better performance. A good and stimulating environment

may appeal to the ego of the person and the ego can motivate a person to push forward. Environment, if good, can secure the attention of the person and enable him to develop interest and enthusiasm in his surroundings. They may arouse his motivation and affect his behaviour in a number of ways. It may also develop his attitudes and attitudes have significant relationship to motivation. Thus it may be concluded that the quality of environment, in which the person lives, may become a strong factor in determining and sustaining motivation in a person.

The drive for self-actualisation may also set a condition of motivation in the person. Allport, Forman Maslow and Rogers have demonstrated the relationship between state of motivation in a person and his drive for self-actualisation. An individual has his own uniqueness and he has his own experiences which determine his conduct. An individual wants to discover his real self and in the process for his discovery he may have to undergo lot of trials and tribulations. A helpful environment may assist him in this pursuit and it may enhance his curiosity to work till his selfhood is fully unfolded. This quest for identification of individuality serves as a strong force in a person to explore. The character and implication of this inner need in a person is deep and this depth adds intensity and reputation to his eagerness to place himself in the environment in which he is born. The quest for self-actualization is therefore, motivational in character in persons.

Anxiety can be served as a motivating source in the sense that it can arouse and determine the activity and the ability of a student to learn.

The child is an aspiring, dynamic and a thrilling individual. He has a total personality. Care has to be taken that he is not ignored as a non-entity. Experiences given to children should be relevant to his maturation level, should deal with his interests, should appeal to his sense of well-being and ego and should appeal to his attitudes. Tasks given to children should be within his grasp and it should be coordinated with his total social, emotional, mental and psychological development. Learning among students cannot take place without proper motivation. Mental activity on the part of the learner is essentially a motivational problem. Level of the mental activity is best ensured through strong level of motivation. Motivation is a gateway to learning.

There can be a number of factors which may arouse motivation in a person. Biological, social and emotional needs have already been explained. Supervision, teamwork pay and security may also affect motivation. Guidance, personality of elders and teachers, abilities and disabilities in a person may also influence motivation. Unconscious factors, anxiety, fears, failures, successes, ego-involvement, social rewards, experience, frustration and conflicts can also

be factors that influence the behaviour and can affect the motivational state of persons. Dynamics of behaviour is deep and the human organization may react to various factors in a characteristic way. Emotions can be swayed in a person through a series of factors. This being so, there are very large number of factors that affect the motivational process in a person and that being so, the actual factors that may affect behaviour in human beings can be large and diverse.

MOTIVES UNDERLYING CHILD'S BEHAVIOUR

It is very important for the teacher and parents to know exactly which main motives underlie the child's behaviour. The following motives are very important from various points of view:

1. Curiosity or exploratory motive

From an early age the child is attracted towards the objects around him. At the age of about four he begins to ask: "What is this?" "What is that?" Father or mother gets annoyed when sons or daughters ask this question too often and generally evade the answer by rebuking them severely. This is the stage when the child is acquiring a vocabulary of new words and terms and must be given as much help as possible. The names of birds, animals, trees, fruits, etc., may be learnt by him if parents answer in an encouraging manner. The child of six years is very curious. He asks "What is this?" "How is that?" and his attention is easily diverted to moving and living objects. Teachers and parents can guide children in acquiring correct knowledge by answering these questions correctly and sympathetically. The child from 6 to 7 years of age is very eager to find out the "why" of things. "Why does the sun rise?" "Why does an aeroplane fly?" By asking these questions the child is increasing his range of knowledge and trying to satisfy his craving for further enlightenment. Teachers and parents should not only give the answers themselves but encourage children to search for proper answers to their questions in books. Curiosity is an indication of knowledge and the more it is stimulated by teachers in classroom lessons, the more chances the child has of grasping the subject matter taught. Curiosity becomes more reflective after the age of ten when the child begins to think and ponder deeply. This type of curiosity should be stimulated and satisfied. Lessons in social studies and other subjects must give scope for its free play. Some of the world's greatest people like Christopher Columbus, Newton, Marconi and others were possessed of great curiosity which impelled them to go forth in search after truth, and to give knowledge and enlightenment to generations after them. The old teaching discouraged children from asking questions.

2. Acquisitive motive

It is from a very early age that this motive shows itself. It may

become the basis of selfishness, cheating and greed if left to itself, but through processes of training may become very useful and a cause of good work. The child exhibits this motive by bringing to collect little pieces of paper, tiny sticks, stones, feathers, etc. Some of the greatest treasures of art in the world are a result of the sublimation of this motive and through it much valuable services may be done not to the individual alone, but also towards the welfare of the group.

3. Constructive motives

The child of four years who sees an object near him, tries to handle it and throws it about here and there. As he grows older he likes to make and break things, to tear papers, to make paper boats, to transform and change things to his own liking. Parents and teachers are very much upset by the child who is constantly fidgeting with things and trying to make something of the other. Actually this is a very useful motive. It is a part of the creative desire in human beings which leads them to make new things. Activities like clay modelling, paper tearing, paper cutting, paper folding, wood work, basket making, needle work, satisfy this motive in the child. The duller of the lessons become very easy and interesting if it is followed by some constructive work related to it.

4. Self-display motive

Consciousness of his physical and mental abilities leads a child to display himself. He wants to attract the attention of others to himself and is eager to win their praise. Children may be provided with suitable occasions of self-display, otherwise they try to attract attention of others by undesirable acts. Whenever they do good work, it should be properly appreciated.

5. Self-abasement motive

This motive is at work when the child is in the presence of superior persons. It makes the child submit to authority. When used with caution, this motive is very useful in making the child orderly and obedient, but it must not be used to create fear or inferiority in the mind of child. Very little use should be made of punishment in the school, as it creates such feelings or the combat motive.

6. Combat motive

It is stimulated when some strong impulse of the child is thwarted. It shows itself in very considerable forms at times and teachers, therefore, try to repress it. This repression is harmful. Under proper direction this can be of great help in the education of the child. The child should learn to fight against what is wrong, untruthful and to overcome them.

Needs

According to psychologists there are a number of needs and motives that underlie the feelings, thinking and overt behaviour of children. These needs, urges and the drives are the basis of personal adjustment and are the forces which cause children to learn and to work.

These terms belong to the same family because their meanings are closely related. They are mutually dependent on each other and have cause and effect relationship.

Need indicates a lack of something which is useful or desired. A person has a need for food when he is hungry, water when he is thirsty, clothing when he feels cold, and medical care when he is in pain. A person has need for company when he is lonesome, entertainment and excitement when bored by monotony, praise and success when he feels inadequate, and activity when he has been sedentary in his living.

What is very closely related to need and indicates the state of having need or desire for something. An individual has want for safety, income, friendship, importance, variety, rest or freedom in order to be healthy and happy. These are his wants because of his need for them. According to the individual's physical and psychological conditions, he will have drive or urge for eating, sexual activity, achieving distinction, gaining liberty, taking a brisk walk, becoming wealthy, or being very careful to avoid accident. Motive is thought, feeling, or condition that causes one to act. It is a need or organic state that prompts us to action. We think motive as a condition or a state which functions as a prevailing force for more than just a short time. For example a person is motivated to practise singing and to try to become an excellent singer because he feels that he can make a good living as a singer. A young man works hard to achieve economic status because he was poor as a boy and he does not want to remain in that condition.

Our thoughts, feelings and conditions will at certain times cause us to lie down and rest, at other times to take a few cold drinks so that we will get rid of our tensions and feel better, or to work overtime to earn some extra money, to invite friends over to dinner, or to try to become wealthy, write a book, give a speech, or do something that will attract favourable attention and thus give us recognition and prestige. We have the urge or drive to do these things.

The human organism has various needs and wants and motives. They are not separate or distinct but closely inter-related and inter-dependent. They are the dynamic forces. These are discussed in detail as under:

I. The Need to Live

It means food, clothing and shelter. It also means struggle against disease. Everyone wants to live. We are terribly afraid

when our lives are threatened. When seriously ill, we are greatly concerned about getting well because we do not want to die.

This strong urge to live has been called the instinct of self-preservation—the instinct to preserve oneself or to keep on living.

If we want to live, we must be free from illness. Children must keep clean in order to avoid infection, eat good food because they will feel better and live longer, and avoid the use of liquor and other narcotics because they can cause illness and shorten life. Everybody has a desire for long life.

II. The Need for Economic Security

This means the avoidance of poverty. It also means:

1. A job and income.
2. Life free from poverty.
3. Building, land, equipment, animals, trees, etc.
4. Money in the bank.

People desire to earn good wages and have adequate income so that they will be secure economically. They want enough money so that they can have good clothing and shelter. They save money in order to have security in their old age, when their earning power has been lost. In order to satisfy the want for economic security, they are acquisitive. When children are asked as to why they go to school and why they want to get good marks in the school they say that an education will help them in getting better jobs and that if their marks are good they will get better recommendation from their teachers and principals. Economic security makes people better and happier and has a good influence on their personalities.

III. The Need of Social Security

This means the avoidance of solitude and lonesomeness. It also means:

1. Belongingness.
2. Social acceptance.
3. Friendship.
4. Love.
5. Affection.
6. Companionship.

Among organizations for obtaining social security are:

1. The family.
2. Teams.
3. Clubs.

4. Unions.
5. Congregation.
6. The school.
7. Gangs.

By the need for social security we mean the want for friends and companionship and the desire to be with other people. This desire to be and the practice of being in a circle or friends or in a group, audience, or crowd is called gregariousness.

Connected with this is our desire to be liked by others. We want to be thought well of, and we are deeply concerned about what others think of us. Children want to be known.

Those pupils who are socially secure in their family because of harmonious living and because they get love, generosity and justice are likely to be emotionally healthy. Those, however, who are insecure in their family life because of parental dissension, over-severity, poverty and parental neglect may be shy, fearful, depressed and troublesome. Security or insecurity in home has a very strong bearing on a child's personality.

Pupils want to be respected members of their classes. They want the approval and friendship of their teacher and also the approval and friendship of their classmates. Each pupil wants the feeling of security, of being an active and successful member of his classes.

The teacher too should want the friendship and approval of his pupils. His or her personal relationship with his or her pupils should be so successful that she has their goodwill and confidence. Such a relationship gives the teacher a feeling of social security and this is conducive to good teaching and happy living.

Before going on to a statement and explanation of the other needs and drives, it must be pointed out and emphasized that all of them are closely related and similar to many ways. The needs and urges have common elements and are similar in several respects, as has already been made clear in the discussion of the various aspects of security, and as will be more evident in what follows.

IV. The Need for Personal Worth and Superiority

This means the avoidance of shame and inferiority. This also means:

1. Success.
2. Leadership.
3. Mastery and power.
4. Favourable attention or recognition.
5. Prestige—good status.

6. High standing self-enhancement.
7. Approval.
8. Importance.
9. Self-respect esteem.
10. Worthiness.
11. Self-satisfaction.
12. Honour.

Every human being wants to have a feeling of personal worth, he wants to have recognition, to be well thought of and to have standing.

When a person buys a large expensive car, he does so not only for the extra riding comfort such a car gives him. He wants the admiring attention of the people who see him in the car. He wants the prestige and the attention that the ownership of a big expensive car gives. The child in the cradle wants attention. If attention is given to someone else in his presence, the young child will feel insecure. When children go to school they seek the appreciation of their teachers and fellow pupils. They like to have their work displayed and achieve recognition.

All through life, people seek rewards, prizes and recognitions. Many want to be leaders because leadership has ego value. We like praise and recognition that enhances our value of self-esteem.

A feeling of value and importance makes us feel happy, and a feeling of unworthiness and inferiority makes us unhappy. Just as in the physical world nature abhors a vacuum, so in the psychological world human beings abhor a feeling of inferiority. We are willing to work hard to achieve a feeling of worth, but often we engage in tricks and dodges in trying to achieve it.

The means used by teachers and the school such as prizes, praise, school marks, honour rolls, being made a leader, being as the head of the class, being chosen for the team and other recognitions appeal to the feeling of personal worth and superiority. They also give a feeling of security, which in turn contributes to a feeling of worth, but the important problem is to have all pupils achieve enough recognition and success.

Care needs to be exercised in any appeal to the feeling of worth lest a child become egoistic or conceited. It is well to achieve a healthy feeling of worth or importance but such a feeling, if too strong, invades the feelings of other people and generates antagonism. Everyone should feel worthy but accompanying this should be modesty that invites the goodwill of others.

The development of feelings of personal worth and superiority has more to do with personality and emotional health than anything else.

V. The Need for Health, Comfort and Feeling of Well-being (the Avoidance of Illness, Discomfort and Pain)

This also means:

1. Body needs and processes.
2. Air breathing.
3. Food-digestion and elimination.
4. Liquids—absorption and elimination.
5. Rest and sleep.
6. Healthy, comfortable surroundings.
7. Clothing.
8. Equipment—beds, charts, tables, etc.
9. Climate—humidity and temperature.
10. Sanitation and medical care.
11. Protection and safety.
12. Mental and emotional health needs.

So uppermost is the idea of health that one of the most common questions is "How are you feeling?" Health, comfort and feeling of well-being are important both psychologically and physically. Mind and body are not separate in this respect, although one may be more involved in illness.

It is common for us to think of health and feelings of well-being largely in terms of the avoidance of fevers, colds, and stomach-pains. A good state of health, that everyone seeks, is accompanied by a feeling of well-being. A poor state of health is accompanied by pains.

Thus, two factors that influence behaviour a great deal are a feeling of well-being on the one hand, and pain on the other. The one is positive, and the other is negative.

Life is controlled to a great extent by a feeling of well-being or satisfaction and avoiding those experiences which give us dissatisfaction or pain. Satisfactory experiences are healthful, and, of course, healthful experiences are satisfactory. Correspondingly, unsatisfactory and painful experiences are usually not healthful.

The need and want for a healthy painless life are strong. Every school should offer adequate health service so that the students can have attention to the following:

1. Mental and emotional problems.
2. Sensory defects—eyes, ears, nose, etc.
3. Nutrition.
4. Healthful exercise.
5. Skin diseases.

6. Headaches and their causes.
7. Fatigue.
8. Other health needs.

In the classroom the teacher should be alert to lighting, seating, ventilation, and other conditions that contribute to the comfort of the surroundings. Parents should study health education and should acquire the attitudes and knowledge which will enable them to take care of the health needs of their children.

VI. The Need for Stimulation, Activity, Enjoyment and Satisfaction (the Avoidance of Monotony and Boredom)

This also means:

1. Work.
2. Play.
3. Reading.
4. Music.
5. Painting.
6. Travel.
7. Visiting.
8. Oral expression—speaking, singing and shouting.
9. Drinking and Eating.
10. Manipulation.

The individual wants to be stimulated interestingly and satisfyingly and, therefore, he tries to engage in and to watch enjoyable activities. Much happiness is obtained when a person places himself in situations which are stimulating and satisfying. Monotony and boredom are depressing.

The human organism with its eyes, ears, nose, taste buds and skin craves a variety of pleasing stimulation. People spend almost limitless amount of money for pictures, for concerts, the theatre, ball games, horse racing, motoring and travelling—all in the pursuit of pleasure and excitement. We want variety to prevent monotony and boredom. In order to be healthy, we must engage in many pleasant activities.

We like to be in a situation where there is "something doing" as we say. We like to be stimulated, to see people, things, and interesting actions, such as races and games to hear music, speeches and conversations, to feel the presence of others, to feel a warm sun and soothing breeze, and to taste, to eat and to drink.

We not only want to be stimulated pleasantly through our senses, we want to be in action ourselves. We crave to be up and doing.

We want to be with people and to talk to them. We want to play games, to dance. We want to be on the move, walking or riding.

In the growth and development of a person, learning is a major contributor, and it is controlled by satisfaction and dissatisfaction. We are attracted to and tend to learn that which gives us satisfaction and avoid learning that which is unsatisfying.

The human organism grows and develops through stimulation and action. We learn by doing but we also learn because of what we see, feel, taste, and so on.

Children have more urge for stimulation and action than those of any other age group. This urge or drive cannot be suppressed. The parents should utilise it and work with it rather than against it. If teaching is reasonably interesting, children will pay attention. If, what they are doing stimulate them, they are going to be completely absorbed in the lessons, projects or activities.

In the school, children have a tremendous urge for action and for doing, they should not be expected to sit rigidly in their seats for long periods. The time table should be organised so that they can work in groups, so that there is educational handwork, so that they can talk, participate in discussion, play games, and work at the blackboard.

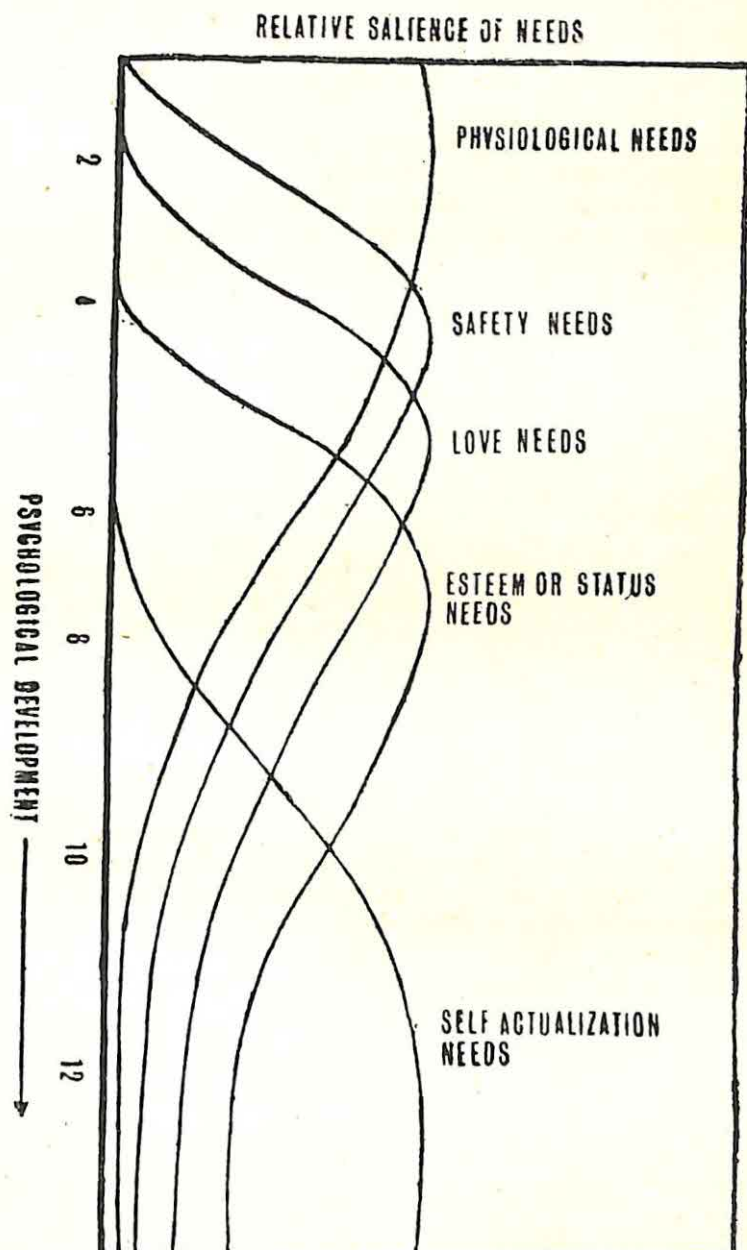
In old schools of India, an attempt was made to repress this craving for activity. The result was that the children were always annoying the teacher with their restlessness and would often break out into the more dramatic forms of pranks and mischief. The fact is that children cannot be repressed. This means that they cannot or should not be controlled but that it is best to utilize their want to be stimulated and to be doing. In the typical modern schools, games, sports, athletics, dramas, parties and funfuf activities are enjoyed by most of the students of all ages and grades. In stimulating them, visual aids make an appeal. The uses of films, both sound and silent, slides, radio, photographs, demonstration, apparatus, objects, tools and materials satisfy the natural want of children and contributes to effective teaching.

VII. The Need for Freedom and Liberty—Individuality

This means the avoidance of regimentation, control and imprisonment. This also means:

1. To think.
2. To create.
3. To do.
4. To express oneself.
5. To make decisions.

6. To determine one's course of action.
7. To be free, to go about.
8. Self-government.
9. Equality of the individual.



We always see that when an infant or young child is held firmly so that he cannot move, he will cry and struggle to be free. He resists restraint.

Thus, in school, children want the right to do their own thinking and express themselves freely. They do not like to be governed by rules and regulations whose purpose they do not understand. But fundamentally neither do they enjoy in a school where there is so much freedom or when there is disorder. Children find fault with a teacher in whose room they can behave in a disorderly fashion. The diagram (page 147) implies that certain objectives of education will vary according to the child's stage of development. It also implies that at each stage certain objectives will be central and others peripheral and that there will be changes in the central objective of education according to the level of development the child has reached.

Running through Maslow's higher needs there is a considerable emphasis upon what Murray had earlier called the need for achievement. Murray⁴ (1938) and McLelland *et al.* (1953)⁵ had stressed the need for children to achieve in skills and activities held in esteem by the peer group and by the adult groups. Through achievements, especially those in reading, arithmetic, spelling (the school subjects generally) and in play and sporting activities, the child comes to a feeling of inner strength. The acquisition of skills aids the child's personality development and adjustment. Usually total personality development is regarded as one of the over-all aims of education and the claim advanced here is that achievements in valued activities and skills promote this end. Skills are thought of as complex patterns of highly efficient behaviour which may be physical, social, verbal, scientific, mathematical, and above all that most complex and all-embracing activity which we call thinking. It remains to determine that the skills acquired are those that have social and psychological significance which will cause them to be valued by the community. The acquisition of skills implies careful and painstaking teaching and learning. This does not rule out the possibility of high interest level and even of an inspirational handling of skills—indeed both are highly desirable—but it does point to the need for patient careful work and to the necessity to judge and reward teacher effort in terms of fundamental and lasting contributions to development, rather than in things that are showy and ephemeral.

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The needs of primary school children have recently been examined by Lobdell and Van Ness (1962). They point out the need for children to have access to and association with their peers in achievement, not just their peers in age. This gives recognition to the established facts of individual differences in achievement (and therefore in needs) and the possibility of these differences being met, at least in part, by techniques of organization such as non-grading, cross-grading, subject grading, and schemes for individual progression.

Implications for Education

1. The first step in school learning is to meet the school emotional needs of the child.

2. This accomplished the task of greatest importance is then to develop in children skills and competence which are valued by the children and by the community.

3. Throughout this learning it must always be remembered that the social-emotional factors can quickly disrupt learning while a good adjustment permits learning to proceed. It is equally true that good progress in learning makes for a good adjustment. Because social, emotional and learning factors interlock the school course and should be such as to promote satisfactory adjustment in both of these areas. This means that 'dead-wood' should be cut away so that the school course is essentially interesting, realistic, related to felt social needs and oriented to practical everyday problems.

4. Proper socialization of the child means,

- (a) that he learns social skills and forms social relationships; and
- (b) that he learns to achieve a degree of freedom and independence from group domination which we call inner-directedness.

The school course and organization should be such as to facilitate these ends by providing opportunity for group activities and for individual progression.

5. The human behaviour is dynamic and it is impelled by certain energies and forces. What people do can be explained and understood best in terms of needs and motives. The teacher can understand the responses of his pupils and how to teach them most effectively when he knows their needs and motives.

6. In the field of education, the area of emotional health and learning is of first importance. Understanding our basic wants and needs helps us to improve our learning and mental health. In a

general sense, if we can gratify our needs and motives, we shall be emotionally healthy and happy. In order to understand why and how we learn, we need to understand the fundamental motives that underlie learning.

7. People have a need and want for economic security. Therefore, they work and save so that they will have the means for acquiring the food, shelter and clothing and other things they need. A shortage threatens life, and being without it, brings death. Thus, economic security and security of life are closely related. If a person builds up his economic security he gains a standing and prestige. Consequently, he develops a higher self-esteem and feeling of greater personal worth. Similarly, the urge and want for companionship and friendship results in a feeling of belonging, and enhances the sense of importance. In similar ways, the needs and wants for stimulating activities, health and comfort, freedom and liberty can also be shown to be related with the other needs and drives. Without the basic needs there would be no human beings for there would be no forces to keep them in existence. If we get along well with people, have good jobs and make plenty of money, are married to the right person, have a variety of interesting experiences, are in good health and are free from undue restraint, we are likely to be happy and wholesome. Our wants, urges and drives will be satisfied. We shall have a feeling of security and life will not be dull. There will be comparatively little pain, life will be comfortable and freedom will be enjoyed. And with all these satisfactions will go the feeling of personal worth—or satisfactory ego value.

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——— *Emotion in Man and Animal*, New York, Wiley, 1943.

POTENTIALITIES FOR HUMAN NATURE

IN THIS chapter we consider the physiological structures which influence human behaviour and personality development. It is not possible to identify psychological behaviour with particular biological structures. The organism tends to act as a whole, and consequently large portions and not just isolated aspects of the organism participate in behaviour. Furthermore, individuals do not hold steady like machines or monuments. The individual may react to an awareness of his physiological deviation (or imagined deviation) and by various adaptive techniques achieve an entirely unexpected response. Biological forces are important not only for the direct chemical or mechanical influence they exert on the organism, but for the influence they have on the attitude the individual towards himself.

In spite of the complexity of the problem, it is apparent that personality takes its beginning in protoplasm; and throughout life, habits and attitudes develop that are characteristic of the manner in which each organism satisfies its needs and adjusts to its environment. The better we understand the chemistry, structure, and dynamics of human physiology, the better we will understand the intriguing problem of human behaviour.

The adaptability of organismic structure of man is largely associated with the development of the nervous system. One-celled organisms like the paramecium and amoeba have no nervous system; their adaptation to the world is mechanical. As we go up the evolutionary scale, the complexity of the nervous system increases as does the kind of things the organism can do. Nature has provided those organisms which are primitive in their nervous structure with instincts, which enable them to operate on the basis of stereotyped behavioural responses. These responses function satisfactorily for survival if the stereotyped habit is effective in the particular environment; but the organism is limited in its variability and adaptability. Human beings, with the most complex nervous system,

of all, are dependent very little, except for basic physiological functions, upon unlearned and stereotyped behaviour. Thus, the infancy of humans is prolonged and dependent upon the aid of adults, who care for the child until maturation and learning enable him to use his nervous system, which, once mastered, makes possible an infinite variety of responses. To a large extent the human animal is not contained in or determined by the environment as are the lower organism, because of his nervous system which enables him to make a greater variety of responses and to some extent to modify his environment.

Not only is this true among the variety of living organisms, but it is true within the life of each human being. At birth a child is dependent upon unlearned and somewhat automatic physiological reactions, to take care of his needs. Sucking, swallowing, digestion, evacuation, etc., are acts performed without learning. But if the infant is to survive in the adult world, he has to learn to initiate many complex adaptations to solve his problems. The nervous system makes this possible; without it, the infant would simply vegetate. Consequently, the adequacy and competence of the nervous system is of the greatest importance in the development of human nature.

Nervous System

The nervous system is a complex system in the human body. It conducts and controls human behaviour. Our whole body depends on this system. Nervous system regulates the various movements of our body. It controls the secretion of different glands. It also receives all types of sensations from the different organs. Nervous system receives stimulations of external world through the sensory organs and to transmit them to muscles and glands for making necessary movements or adjustments needed for the maintenance of the fullest possible amount of life within the individual. Nervous system can be compared to an elaborate telephone system where message (sensation) is received from the sensory organ and is sent to the person concerned (muscle or body). Thus nervous system is responsible for all types of human adjustment or behaviour.

We think, learn, understand, remember, love, hate, fear, rejoice and will. We rely upon the five senses of touching, tasting, smelling, hearing and seeing. Our organs are guided, directed and governed by a system known as the Nervous System.

The nervous system functions as below:

1. It coordinates the activities of different parts of the body.
2. It enables us to perceive the external world and respond to external stimuli (disturbances).

The functions of different jobs are given below:

1. The Cerebro-spinal System or Central Nervous System consisting of the Brain, the Spinal Cord and the Nerves arising from them.

2. The Sympathetic System is connected with the organs of digestion, circulation and respiration. It consists of two chains one on either side in front of the Vertebral column extending from the Skull to the Pelvis. On the course of these chains are situated numerous small knots known as ganglia or collections of nervous matter from which nerve fibres are given off the organs of digestion, circulation and respiration, and to the spinal cord.

Nerve Tissue. The central and the sympathetic nervous system are formed of two kinds of the nerve tissue, the grey matter and the white matter. The grey matter is greyish-pink in colour and consists chiefly of nerve cells. It is found in the brain, the spinal cord and the nerve centres. The white matter consists chiefly of nerve fibres which are slender, silvery white threads spreading in almost every corner of the body.

Under the microscope the grey matter is seen to consist chiefly of nerve cells, and the white matter of nerve fibres.

Nerve Cell. Unlike other cells, a nerve cell has many processes given off from it. Most of these processes branch and interlace with those of the neighbouring nerve cells but one of these branches is distinguished from the rest by not branching except at its end. This is very long and is covered by a sheath. It is called the Axon.

Each nerve cell with its branches acts quite independently. It is connected with other cells by the interlacing branches of its processes. A nerve cell with all its processes is called a Neuron. It must be remembered that the connection between one neuron and other is made through the contact of branching process only called the Dendrons.

The white matter consists of nerve fibres which are continuations from the nerve cells in the neighbouring grey matter. Thus, the whole nervous system is a collection of Neurons.

Nerve. A nerve is a bundle of nerve fibres, enveloped in a covering of connective tissue. It is connected with a nerve cell and looks like a white, silvery thread in the body. Nerves are of the following kinds:

1. Sensory or Afferent nerves are those which carry sensations from the various parts of the body to the brain.

They make us aware of the various sensations.

2. Motor or Efferent nerves are those which carry orders of

the brain to the muscles of the body. They cause contraction of muscles. If a nerve causes glands to secrete, it is called a Secretory Nerve, and if it causes changes in the calibre of a blood vessel, it is known as Vasomot nerve.

3. Mixed nerves are those which contain both the sensory and motor nerve fibres. They carry impulses to and from the brain. A sensory and a motor nerve generally run side by side. All afferent nerves are not necessarily sensory, and all efferent nerves are not likely motor.

The rate at which an impulse travels in a nerve is about 100 feet per second. The parts of the body which have no nerves are the hair, nails, cartilage and the epidermis of the skin.

THE BRAIN

The brain is the large upper portion of the central nervous system. It fills the cavity of the Cranium. The weight of an adult's brain is between 52 to 56 ounces and that of a woman from 44 to 47 ounces. It sometimes exceeds that weight in persons of extraordinary mental power.

It is enclosed by three membranes:

1. *The Pia Mater.* It is an exceedingly fine membrane which closely lines the various parts of the brain. In this thin membrane the blood-vessels break up before entering the substance of the brain. It consists of connective tissue containing a close network of blood vessels.

2. *The Arachnoid Membrane.* It is the middle membrane. It is a thin membrane which surrounds the pia mater and keeps the inner surface moist by a fluid called the Arachnoid fluid.

3. *The Dura Mater.* It is a tough whitish outermost membrane which lines the inner surface of the skull, and forms loose outer covering for the brain. It is full of arteries and veins carrying blood to and from the brain.

Divisions of the Brain

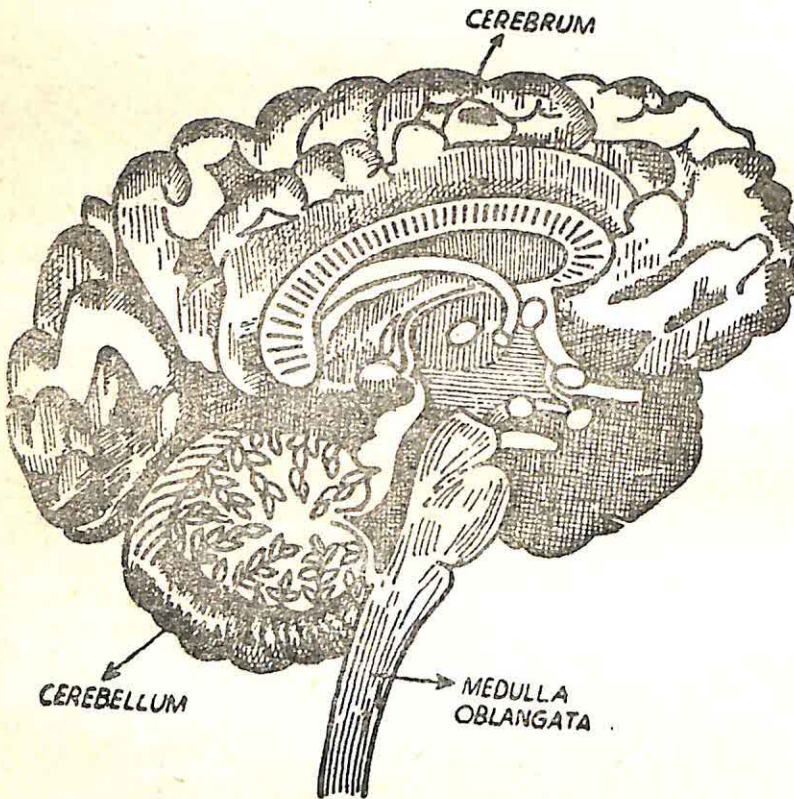
The principal masses of the brain are:

1. The cerebrum.
2. Cerebral peduncles.
3. Pons verolli.
4. Cerebellum.
5. Medulla oblongata.

The Cerebrum or the Brain Proper

It forms the greater bulk of the brain and fills the whole of the upper part of the skull. It is divided by a deep fissure called the Central Fissure, into two parts. Each part is called a Hemisphere. Each hemisphere is again divided by depressions into four small divisions called Lobes. The Lobes are:

1. The Frontal Lobe.
2. The Occipital Lobe.
3. The Parietal Lobe.
4. The Temporal Lobe.



SECTION OF THE BRAIN SHOWING FISSURES

Appearance. The cerebrum has a folded appearance, its various folds or convolutions being separated by deep clefts. Some of these clefts are very deep while others are shallow. The folds are called Gyri and the clefts known as Sulci (singular sulcus).

The outer surface of each hemisphere is grey in colour and

hence it is called grey-matter of the Cortex. It is made up of Neurons. The interior portion of the brain consists of white matter and is formed of axon or nerve fibres.

The active powers are exercised by the outer layer of cortex. The intensity of a mental action depends upon the number of folds the cortex possesses and its thickness. The greater the number of folds and the thickness, the greater is the mental power of a person. Each hemisphere has a distinct cavity in its interior known as the Lateral Ventricle.

Functions of the Cerebrum. The cerebrum is the centre of intellect, memory, will, emotions like love, hatred and fear sensations. It enables us to think, remember, observe things around us through the five senses. Different portions of this part of the brain are assigned different functions. An injury to this part may destroy intellect and the man may become unconscious. He may be without any will or emotions. This part is affected most by intoxicating drinks. Children with less developed cerebrums are born idiots.

The functions of different lobes are:

(a) *Frontal Lobe.* The back part of the frontal lobe controls the motor activity of the body. The motor gyrus controls the muscles of the whole body. The arrangement of the controls is upside down. For example, the muscles of the face are represented in the lowermost region of the gyrus and those of the feet and legs are represented in the uppermost part. If the gyrus is injured, the muscles on the opposite side will not work and will get paralysed.

In the lower part of the frontal lower just near the lower portion of the motor gyrus is a collection of the cells which controls the speech. This area is called the Broca's speech area.

A person loses the power of speech if this area is injured. On the under surface is an area or centre for the smell and taste. This is responsible for the sensation of smell and taste.

(b) *Parietal Lobe.* This is the most important centre of the brain as it is the seat of intelligence, emotion, love, hatred, fear, pain, heat, cold and the sensation of touch. The senses are lodged in the gyrus lying behind the fissure dividing the frontal from the parietal lobe. This gyrus is known as Sensation Gyrus. The arrangements of control is again upside down.

(c) *Occipital Lobe.* It is situated at the back part of the brain. This area is the seat of vision or sight. Any injury to this part gives rise to the loss of vision.

(d) *Temporal Lobe.* It lodges the sensation of hearing. It is here that sensation received from the ear is translated into consciousness and the person hears various sounds. Each cerebral

hemisphere controls the opposite side of the body, i.e., right hemisphere controls the left side of the body and the left hemisphere controls the right side of the body.

Cerebral Peduncles

It connects the pons verolli with the cerebrum. It is on its lower surface that the pituitary bode is situated. Inside the peduncles there is a cavity called the Third Ventricle which connects the Lateral Ventricle with the Fourth Ventricle situated in the Medulla Oblongata.

The Cerebellum

Appearance and Structure. The cerebellum or the lesser brain lies underneath the back part of the cerebrum or the dorsum of the Pons and Medulla Oblongata. It is separated from the Cerebrum by a fold of the Dura Mater. It consists of two halves or hemispheres. Its weight is about 110 of the entire brain. It consists of grey matter enclosing a core of white matter. The furrows are deeper than in the Cerebrum. A section of the Cerebellum presents a tree-like appearance (*Arbor viti*—tree of life).

Functions of Cerebellum

1. It coordinates the muscular movements of the body.
2. It maintains the equilibrium of the body in complicated acts like wailing, running, speaking and jumping, etc.
3. It is responsible for the sense of localisation i.e., a sense which tells us the exact position of various parts of the body, for example, nose, ears, feet, hands, etc.
4. It is the seat of the muscular sense and it enables us to estimate the weight of a body without weighing it.

If this part of the brain is injured or gets diseased, there is loss of the abovementioned functions.

A person cannot maintain the balance of his body and will tend to fall at every step. He cannot make any movements smoothly. His movements are akin to the movements of a drunkard. His concerted efforts are incoherent. He loses the sense of localisation. If he is asked to touch his right ear, he will never be able to do so.

The Pons Varolli

The pons, as it is popularly called, is the upward prolongation of the Medulla Oblongata and in-between it is the Cerebral Peduncles. On its dorsum lies the cerebral hemisphere. Fibres from the Cerebrum pass to and from the spinal cord through this band. As they pass, they cross one another in this area. Fibres from the right

hemisphere go through the left side of the pons to the muscles of the left side of the body and from the left hemisphere to the right side. Thus an injury to the left hemisphere causes paralysis of the right side of the body and so on. In front of the pons lies an important ductless gland, the pituitary body.

Functions of the Pons

1. It connects the two Cerebral hemispheres.
2. Nerve-fibres from the Cerebrum to all parts of the body cross here.

The Medulla Oblongata

The Medulla Oblongata is the thick upper portion of the spinal cord which is contained within the cavity of the skull. It is situated immediately under the Cerebellum and forms the link between the brain and the spinal cord. It resembles, to a great extent, the spinal cord in its structure, its exterior being white and the interior of the grey nerve matter. At the back aspect of the medulla is a cavity called the 4th ventricle which communicates with the 3rd ventricle above and spinal cord below.

Functions of Medulla Oblongata

1. All the nerve fibres passing from the spinal cord to the brain and from the brain to the spinal cord pass through it. These fibres cross each other during their course through the medulla.
2. It has an area of grey matter called the Vital Knot which lodges the important centres of lungs (respiration), of heart (cardiac), of swallowing (deglutition), of heat regulation and blood (vaso-motor). If this part is injured or gets diseased, instantaneous death results.
3. Six pairs of cranial nerves arise from parts of the brain in front of the medulla, and the remaining six from the sides of the medulla.

The Cranial Nerves. The nerves of the brain are called the cranial or the cerebral nerves.

These are twelve pairs in number. They arise from or end in the brain. They pass through nine openings in the base of the skull. The following are the twelve pairs of nerves:

1. *The first pair of the Olfactory nerves.* They are the nerves of smell and are spread over the mucous membrane of the upper part of the nose. They are Sensory.
2. *The second pair or the Optic nerves.* They are the nerves of

sight and arise from the eyeball. These nerves cross each other on the ventral surface of the brain in front of the Pituitary Body. They are Sensory.

3. *The third, fourth and the sixth pairs* spread into the muscles of the eyes and control their movements. All of them are motor nerves.
4. *The fifth pair are very large nerves.* Each of them has got three branches. They are mixed nerves and control the movements of jaw. They are sensory for the face and nerve of taste for the front part of the tongue.
5. *The seventh pair spreads* into the muscles of the face and control the facial movements. They are motor nerves.
6. *The eighth pair or the Auditory nerves.* These arise from internal ear and are sensory.
7. *The ninth pair or Mixed nerves.* The sensory nerves spread over the back part of the tongue and is a nerve of taste. The motor part controls the muscles in the act of swallowing.
8. *The tenth pair or the Wandering nerves.* They are mixed nerves. They pass to the larynx, the lungs, the heart, the stomach and the liver and the upper part of the intestines. They are the most important nerves.
9. *The eleventh pair or Motor nerves.* They supply the muscles of the neck and back.
10. *The twelfth pair* control the movements of the tongue. They are motor nerves.

The Spinal Cord

The spinal cord is the continuation of medulla oblongata through the Foramen Magnum running down the spinal canal to the first lumbar vertebra. It is about 16 to 18 inches long. It is about the thickness of one's little finger. It is enveloped by the dura mater, the arachnoid and the pia mater. In the centre is a narrow cavity which is continuous with the ventricle above. It consists of white and grey matter, but unlike the brain, the grey matter lies inside and the white outside. The grey matter is arranged like the letter H, pointing forward and backwards. The front portion is called anterior horn and the back portion is called the posterior horn. The grey matter of the cord is similar in structure to that of the brain, being composed of neurons and the fibres proceeding from them.

The white matter of the cord is composed of medullated nerve fibres. These fibres come from and go to the various parts of the

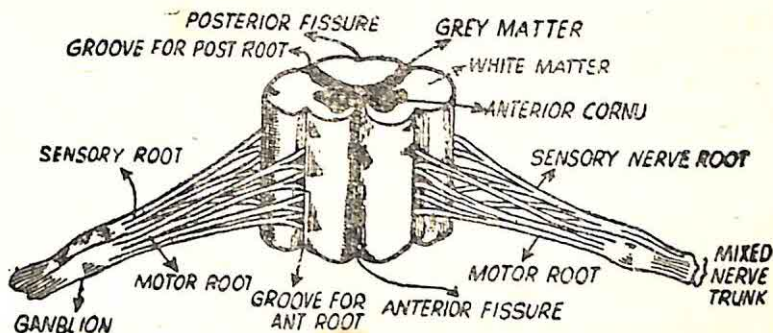


DIAGRAM SHOWING A PORTION OF THE SPINAL CORD SHOWING
A PART OF SPINAL NERVES

brain, bringing impulses from the brain to the body, or carrying impulses from different parts of the body to the brain, the fibres of the right side going to the left side of the brain and vice-versa.

The anterior nerve, root of the spinal nerve, arises from the anterior horn and goes to the muscles of the trunk and extremities and is, therefore, motor. The posterior nerve root of the spinal nerve enters the posterior horn. Its fibres arise from different parts of the body and carry sensory impressions. It is, therefore, sensory.

Before leaving the spinal canal, the anterior and the posterior roots unite and form a spinal nerve. The spinal nerve leaves the spinal canal through a hole formed by the two adjacent vertebra called the inter-vertebral foramen.

The grey matter sends off 31 pairs of nerves called the spinal nerves. These nerves pass out on each side of the vertebral column by means of small openings between two successive vertebrae and divide and subdivide into fine threadlike branches. Each nerve is a mixed motor and sensory nerve containing two roots, as mentioned above. These branching threads proceed to the other parts of the body, where they become nerves of touch or feeling or motor nerve of all muscles. If any one of these nerves gets injured or cut, as it leaves the vertebral column, the power of feeling and movement would cease in all those parts to which the branches of that nerve go and those parts of the body would be paralysed. If the anterior root is injured the power of voluntary movement will last altogether, feeling and sensation remaining unaffected. In the case of injury to the posterior root, sensation is destroyed, but the muscles still obey the will.

Functions of the Spinal Cord

1. The Spinal Cord acts as a telegraph station between the

brain and the various parts of the body. It receives sensations from these parts through its sensory nerves and the posterior roots and conveys the same to the brain.

2. It carries the commands of the brain through the motor nerves to the voluntary muscles and causes various muscles to move. It can be shown graphically in the following manner:

Skin-Spinal, nerve-posterior, horn-cells—Neurons brain-connector fibres-connector cells—Neurons or Motor Gyrus-Afferent fibres (Axons) Anterior horn cell Muscles-Spinal nerves-Anterior root.

3. It also acts as an independent centre receiving impression from certain parts of the body by means of sensory nerves and sending back orders through the motor nerves to the muscles without consulting the brain. This constitutes the Reflex Action.

Reflex Action. An impulse which is sent up to the spinal cord by certain sensory nerves is reflected or sent back at once as a motor impulse to the muscles. Because it is reflected in this way, we speak of it as a Reflex Action. It is an immediate response to a stimulus. A Reflex Action is a movement that results from excitation of a sensory nerve, without our being conscious of it. It is absolutely independent of our will and control.

The following things are necessary for a Reflex Action:

1. An external stimulus.
2. A sensory nerve carrying the external impression.

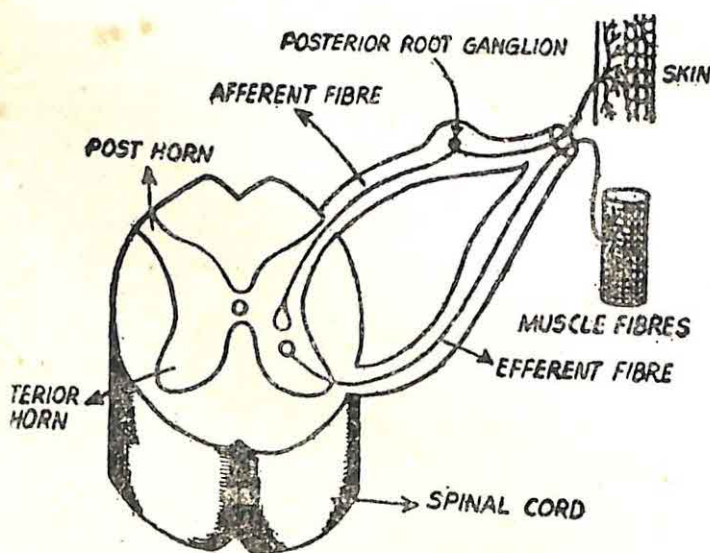


DIAGRAM TO SHOW A REFLEX ARC

3. A centre in the spinal cord independent of brain and in the brain independent of the intelligence.
4. A motor nerve going to the muscle.

Examples of Reflex Action of the Spinal Cord

1. During sleep, when the sole of a foot is tickled, the leg is drawn up.
2. The knee jerk, when we tap the ligamentum patella of a person, who is sitting comfortably with his one leg crossing the other and allowing it to hang freely and loosely, his foot will be instantly jerked forward.
3. When we chance to touch a very hot thing unintentionally, our hand is suddenly taken away from it.

Examples of Reflex Action of the Brain

1. A sudden flash of light may cause the eye to blink. The optic nerves (nerves of sight) are the sensory and the facial nerves, the motor conductors.
2. The instinctive shrinking from a threatened blow.
3. The sudden start of the whole body by a loud and unexpected sound.

Uses of Reflex Actions

1. The Reflex Actions save and protect the body when any part is unintentionally exposed to danger or injury.
2. They give rise to the formation of habits.

Sometimes our leg or foot 'goes to sleep'. The fact is, some of the nerves have been subjected to too much pressure, and their nervous actions temporarily stopped. When the pressure is removed, the nerves regain their continuity.

The Sympathetic Nervous System

The Sympathetic Nervous System consists of a double chain of ganglia or knots of nerve matter lying along each side of the Vertebral Column. The ganglia are connected with each other and with the sensory root of the spinal nerves by a network of grey nerve fibres.

From these ganglia nerves spread over all the internal organs, forming a complete system by themselves and acting independently of the Cerebro Spinal System. A close network of the sympathetic nerves is spread around the muscles of the heart, the lungs, the

stomach, and the intestines, as well as the walls of the minute capillaries and arteries.

This system exercises an influence over the greater part of the internal machinery of the body, and to some extent controls the functions of digestion, circulation and respiration.

Some sympathetic nerves are spread over the coats of the stomach and intestines and are responsible for the movements of those organs during the process of digestion. Other nerves are spread over the walls of the arteries and exercise an influence on the circulation. The muscular rings surrounding the vessels are not under the control of the will. These vessels are controlled by the sympathetic system. Under the influence of these nerves the muscles of the arteries get contracted and the vessels are made smaller and the flow of the blood through them is retarded.

Functions of the Sympathetic System

1. It controls involuntary movements of the heart, the blood vessels, the lungs, the stomach, the intestines and the glands and regulates the processes of digestion, circulation and respiration.

2. Emotions of joy, sorrow, fright, grief, etc., exercise an influence on the functions of these internal organs through the sympathetic nervous system and cause blushing, pallor, loss of appetite, etc. Some emotions spring in the mind and their influence is spread over the sympathetic nervous system. The nerve filaments controlling the blood-vessels lose their hold on them temporarily, causing more blood to flow through them, thus, blushing is the result. News of joy reddens the face and sad news causes pallor. The sad emotion has an influence over the system causing a temporary contraction of the blood-vessels of the face. Less blood, therefore, flows through these blood-vessels, causing pallor.

Sense Organs

A sensation is a simple impression produced in the mind by the stimulus. It is the simplest cognition. The stimulus act upon a sense organ of a sensory nerve; the impression or message is conducted by sensory nerve to the brain; and then a sensation is produced in the mind. Thus sensations are simple impressions of some qualities. Their meanings are not known to us. As soon as their clear meanings are known to us, they become perceptions. Sensations are the most elementary raw material of our knowledge of the external world. They are converted into perceptions. For example, a baby just born will have absolutely pure sensations. They interpret the meaning of sensations. Sensation is distinctly local in character.

Characteristics of Sensations. There are three characteristics or attributes of sensations, for example:

1. Sensations differ in quality. Sensations of colours, sounds, tastes, smell, heat and cold differ from one another in quality. They have different sense organs. They are produced by different kinds of stimuli. Sensations of colours are produced by the action of light waves. Sensations of sounds are produced by the action of air waves.

2. Sensations of the same quality differ in intensity. A dim light produces faint sensation of light. A bright light produces an intense sensation.

3. Every sensation has a duration. A sensation may continue in the mind for a certain duration. Sensations alike in quality and intensity may differ in duration.

Sensation is the feeling produced by the stimulation of some sensory nerve. This point of stimulation is a sense organ which sends the impression to the brain through some sensory nerve. It is through the sense organs that we gain the knowledge of the external world. All sensations take place in the brain. The special sensations, such as sight, smell, taste, hearing and touch are all the work of separate nerves. Special sensations are produced by the stimulation of specially constructed organs called sense organs. The great majority of sensations are produced by some stimulus, or outward agency. Sensations may be either pleasurable or painful. The same agent may cause pleasant and painful sensations according to its degree of intensity. The pleasant sensation of spreading out the hands to the blazing fire on a cold day may change to one of pains by holding the hands too close to the fire. We may feel pain, in the hand, yet the sensation takes place; not in the nose but in the brain.

Conditions Necessary for a Sensation

The following conditions are necessary to produce a sensation:

1. Stimulus which excites one or more sensory fibres through some sensory organs.
2. A sense organ which is specially designed to receive the stimulus and change it into a nervous impulse by irritating the nerve fibres.
3. A sensory nerve which conveys this impulse to the brain.
4. The brain which converts the impulse into an actual sensation and translates it into consciousness.

The Muscular Sense—The muscular sense enables us to judge the weight of different bodies according to the muscular effort required to lift or hold or by which become acquainted with the condition of muscles.

The Special Senses—The special senses are sensations which are produced by the excitation of specially designed organs known as the sense organs.

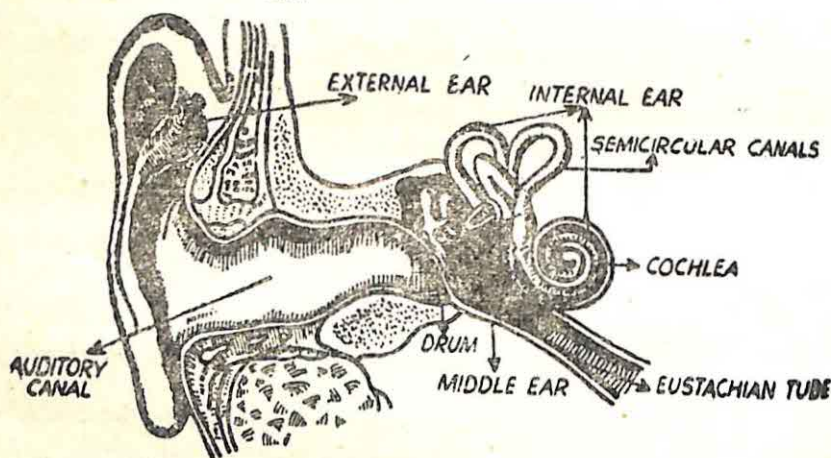
The special senses are:

1. *The Sense of Touch*—This sensation is produced by the skin.
2. *The Sense of Taste*—This sensation is produced by the tongue.
3. *The Sense of Smell*—This sensation is produced by the nose.
4. *The Sense of Hearing*—This sensation is produced by the ears.
5. *The Sense of Sight*—This sensation is produced by the eyes.

THE EAR AND THE HEARING SENSATIONS

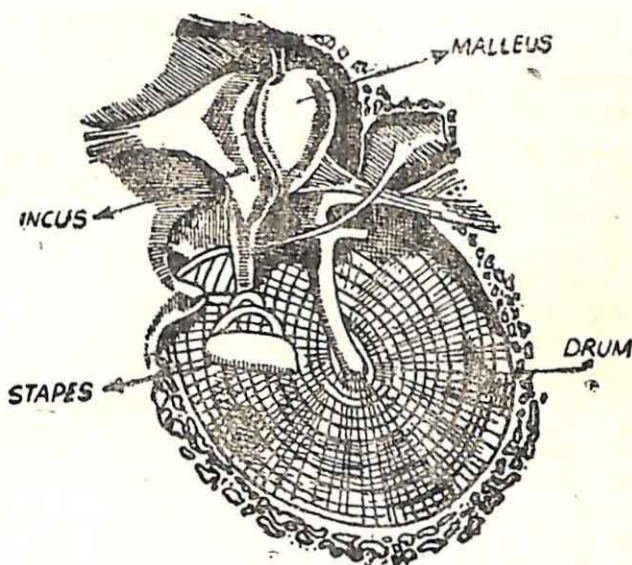
The organ of hearing is lodged in the Temporal bone which forms the side of the skull.

The ears are the organs which collect sound waves and convert them into a nervous impulse for transmission to the brain. The velocity of sound is 1,118 feet per second. Sound travels more swiftly in warm air than in cold but its speed also depends upon the direction of the wind.



OUTER EAR, MIDDLE EAR AND PART OF THE INNER EAR

No sound is possible without air. Thus, if all the air be exhausted from a bell-jar over an air pump and a bell be set ringing inside, no sound of the bell is audible. As soon as the air is allowed to re-enter the bell-jar, the ringing of the bell is heard distinctly.



Inner Aspect of the Drum of the left Ear and the small Bones of the Middle Ear

The Ear

The ear is divided into three parts viz., the external, the middle and the internal ear.

1. *The External Ear*—The external ear consists of two parts:

(a) *The Pinna*—It is an irregular funnel-shaped flap of cartilage covered with skin, with an opening leading into the Auditory Canal.

(b) *The Auditory Canal*—It is about $1\frac{1}{4}$ inches long. It is lined with a thin layer of skin, which has some fine hair and contains glands which secrete the earwax. Both the hair and the earwax arrest dust particles and insects from getting in.

Functions

The Pinna—It receives and collects sound waves and reflects them into the Auditory Canal.

The Auditory Canal—It leads to the Drum of the ear or the Tympanic Membrane and conveys the sound waves to this Drum, which is set in motion.

The Tympanic or the Drum—The Drum is a thin and elastic membrane which stretches somewhat tightly across the inner end of auditory canal and separates the middle ear from the auditory canal. If once broken, this delicate membrane cannot be repaired and deafness ensues.

2. *The Middle Ear*—The middle ear is a small cavity hollowed out in the Temporal bone. It is separated from the auditory canal by the Tympanic Membrane. It is connected at the front end with the Pharynx by means of a passage called the Eustachian Tube.

Eustachian Tube is a tube about $1\frac{1}{2}$ inches long, which leads into the Pharynx. This arrangement equalizes the pressure of the air on the two sides of the Drum.

There is a chain of tiny bones which stretch across the Drum. The first of these is the Malleus or Hammer bone. It is attached by its long handle to the middle of the membrane of the Drum. The rounded head of this bone fits into another little bone, called the incus or the Anvil-bone. It resembles a blacksmith's anvil. At the end of this bone is another little bone known as the stapes or the stirrup-bone. This little bone is like a horseman's stirrup. The footplate of this bone fits exactly into the oval window in the opposite wall of the middle ear leading to internal ear. The function of this chain of bones is to transmit the sound waves from the Drum to the internal ear. The footplate is pushed in and drawn out of the oval window on the inner wall of the chamber at every movement of the membrane of the Drum.

3. *The Internal Ear*—The internal ear is that portion of the organ of hearing which receives the sound impulses, and carries them directly to the brain through a nerve.

It is a complicated irregular-shaped apparatus situated inside the Pyramidal internal portion of the Temporal bone. It is known as the Labyrinth.

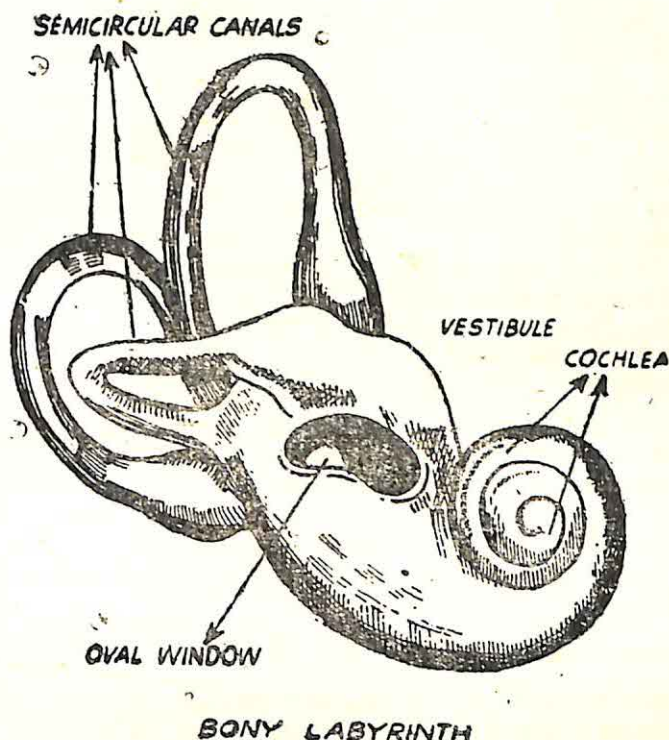
The Labyrinth consists of three distinct portions:

1. The Vestibule.
2. The Semi-circular Canals.
3. The Cochlea.

The Vestibule. It forms the central chamber which communicates with the Cochlea or the shell in front and the Semi-circular canals behind. In its wall is the oval window into which is fitted the footplate of the Stapes.

The Semi-circular Canals. They are three in number. Two of these are vertical, and the third is horizontal. Each bone canal contains within it a membranous canal, at the end of each is a swelling or an elevation known as Ampulla. They maintain the equilibrium of the body and make us aware of our position and movements in different directions. They are controlled by the cerebellum.

The Cochlea. In shape, it resembles a snail's shell. There is a



central pillar, and a long spiral canal winding $2\frac{1}{2}$ times round itself. It is situated below and in front of the Vestibule. Inside this Cochlea is the membranous Cochlea, in which are found the termination of the Auditory Nerve.

The tubes and chamber of the internal ear enclose and protect a membranous bag of exactly the same shape as themselves. This bag which is much smaller than the size of Bony Labyrinth in which it is placed, is called the Membranous Labyrinth. Between bag is a clear thin fluid called the perilymph. The membranous Labyrinth itself contains a similar fluid called the Otoconia. Every movement of the fluid itself throws these minute grains or particles from side to side.

The Auditory Nerve or the Nerve of Hearing. It passes from the brain through a passage in the solid bone of the skull, to the inner ear. Its fibres spread over the inner walls of the membranous labyrinth in two branches, one going to the vestibule and the ampullae, the other branch leading to the Cochlea.

On the central wall of the Cochlea rests an immense number of minute fibrils side by side. These are known as the Fibres of Corti. These cilia pick up vibrations communicated to them. Their

vibrations affect nerve fibres in connection with them and so the impulses are transmitted to the brain.

The Mechanism of Hearing. A body when struck against something produces waves, which are spread all around. Some of these are caught by the pinna and reflected into the auditory canal. The auditory canal conveys it to the Drum, which is set into vibrations in harmony with the sound waves. These vibrations are communicated to the malleus, which is attached to the membrane. Then all the three bones are set vibration in unison with the vibration of the Drum. The stapes is pushed in and out of the oval window. This sets a watery fluid, the perilymph, in motion. When the perilymph is shaken, it communicates the motion to the Endolymph contained in the membranous labyrinth.

From the endolymph the vibrations are conveyed to the hair cells of the organ of Corti. This vibration creates a nervous impulse, which is taken up by the nerve and fibres of the Cochlear Division of the Auditory Nerve and through this nerve the impulse goes to the auditory centre in the Temporal Lobe of the cerebrum, where the sensation is translated into consciousness and we hear a sound.

THE EYE AND THE VISION

The Eyeball and its protection—The eyes are the organs of sight and are placed in the orbits of the bony cavities of the skull. Each is like a ball and the optic nerve holds the eyeball just like the stalk holds the apple on a tree.

In front, the eyeball is protected by the eyelids which are movable folds of skin and muscles. Their inner surface is covered by a thin mucous membrane called the Conjunctiva. This membrane is reflected on the front of the eyeball. The edges of the eyelids can close and open the eye by the contraction of their muscles.

There is a small almond-shaped Lachrymal or tear gland situated in the upper and outer part of each orbit. It continuously secretes a saltish fluid which keeps the conjunctiva moist. The front surface of the eye gets continuously washed by this fluid. Normally the amount secreted is just sufficient to keep the conjunctiva moist and is slowly evaporated from the surface of the eyeball, but when it is secreted in greater quantity, as in weeping or irritation by vapours, it flushes the eye and passes through two small openings in the Lachrymal bones. These openings carry the excess of the secretion into the nose through the Naso Lachrymal duct. If there is still excess of this secretion then it flows down the cheeks as tears.

The Muscles of the Eye—The various movements of the eye are affected by the six muscles:

- 1, The Superior Rectus.

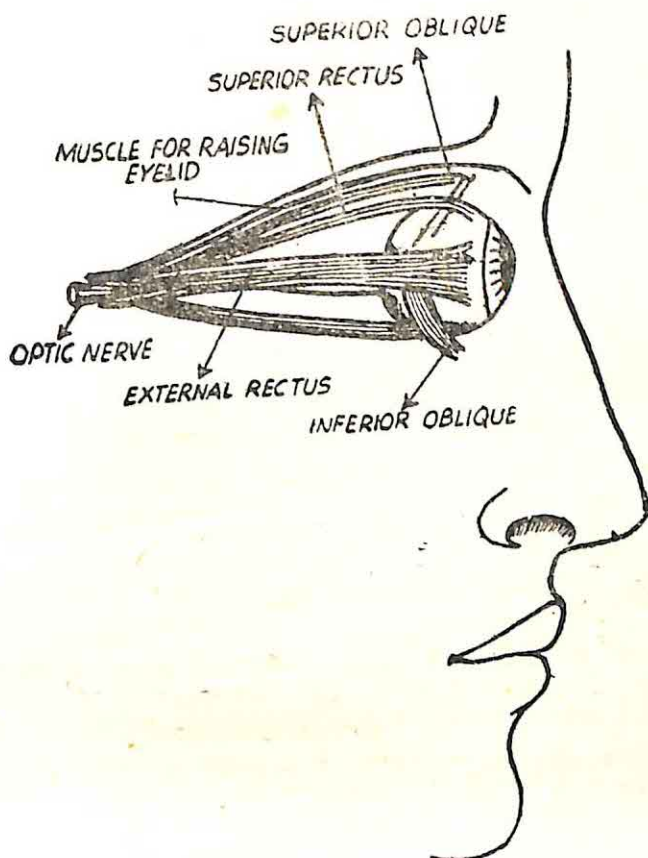


DIAGRAM SHOWING THE MUSCLES OF THE
RIGHT EYEBALL

2. The Inferior Rectus.
3. The Internal Rectus.
4. The External Rectus.
5. The Superior Oblique.
6. The Inferior Oblique.

1. The Superior Rectus is attached on the upper side of the eyeball. It is controlled by the Third Cranial Nerve. It pulls the eyeball upwards with the help of Inferior Oblique by its contraction.

2. The Inferior Rectus is applied to the under surface of the eyeball. It is controlled by the Third Cranial Nerve. It pulls the eyeball downwards with the help of Superior Oblique by its construction.

3. The Internal Rectus is attached to the inner side of the eyeball towards the nose. It is supplied by the Third Cranial nerve. It pulls the eyeball inwards i.e., towards the nose by its construction.

4. The External Rectus is inserted in the outer aspect of the eyeball. The muscle is controlled by the Sixth Cranial Nerve. When the muscle contracts, the eyeball is pulled outwards.

5. The Superior Oblique has its course somewhat intricate. It begins from the external or temporal side of the orbit and passes over the eyeball and reaches the nasal side of the orbit. It passes round a hook at this place and turns outwards, towards the upper and outer aspect. It is inserted between the superior and external rectii muscles. It is controlled by the Fourth Cranial Nerve. When it contracts, it helps Inferior Rectus to pull the eyeball downwards.

6. The Inferior Oblique also has its course complicated. It takes its origin from the nasal side of the orbit and is attached to the under surface of the eyeball between the insertions of the inferior and external rectii muscles. It is controlled by the Third Cranial Nerve. When it contracts, it helps the Superior Oblique to pull the eyeball upwards.

Movement of the Eyeball—The six muscles named above are able to rotate the eyeball in all directions and when they all act together, the eyeball is said to be rolled in a roundabout manner.

It is noteworthy to see that the muscles of both the eyeballs work in unison or in complimentary manner. Thus if the eyes are turned to the right, the External Rectus of the right eye and the Internal Rectus of the left eye contract simultaneously and thus turn both the eyes to the right.

Structure of the Eyeball—The eyeball is globular in shape. It is embedded in fat in the cavity of the orbit. It is about an inch in diameter from side to side. The walls of the hollow ball are made up of three coats:

1. The sclerotic and Cornea.
2. The Choroid and the Iris.
3. The Retina.

The Sclerotic—It is a tough, white opaque coat which forms the five-sixths of the posterior outer covering of the eyeball. It is pierced behind by the Optic Nerve and is supplied with blood-vessels. To it are attached various muscles that move the eyeball.

The Cornea—In front the sclerotic is continued into a transparent circular plate called the Cornea. It forms the anterior one-sixth of the eyeball. There are no blood-vessels in it and it is nourished by the lymph.

Functions : 1. The sclerotic protects the delicate structures lying under it. 2. The cornea forms a kind of window for the light to pass inside.

The Choroid—It is the middle coat of the eyeball. It lies immediately inside the sclerotic and is much more delicate in structure. It contains pigmented connective tissue cells designed to darken the chamber of the eye and to prevent reflection of light by absorbing the surplus rays. Like the sclerotic, it is pierced by the Optic Nerve at the back.

The Iris—The front part of the Choroid which lies behind the Cornea is called the Iris. It is a coloured circular curtain which gives colour to the eye. It is movable and is made up of two kinds of voluntary muscular fibres:

1. The Radiating fibres which radiate from the centre.
2. The circular fibres, which are arranged in the form of a ring. The Iris has a central hole called the Pupil, which contracts or dilates so as to allow suitable amount of light to pass into the eye. In dim light the radiating fibres contract, causing the pupil to dilate and in bright light or sunshine the circular fibres cause the pupil to contract, thus shutting a major portion of the bright light.

Functions of the Choroid and the Iris

1. The Choroid darkens the chamber of the eye.
2. It prevents reflection of light.
3. It absorbs rays of light when the light is very strong.
4. The Iris regulates the quantity of light that passes into the eye.

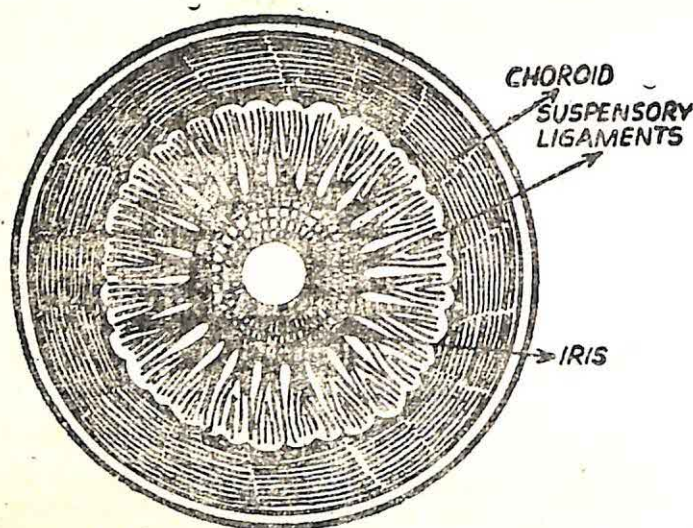
The Ciliary Body and the Ciliary Process

At the junction of the Choroid and the Iris there is a structure called the Ciliary process. To these are attached thread-like structures called the Suspensory Ligaments. These Ligaments are attached on the other side to the capsule of the lens.

There is a muscle inserted in the Ciliary Body. This muscle is known as the Ciliary muscle. This muscle takes origin from the place where Sclerotic ends and the Cornea begins. It proceeds backwards to get inserted in the Ciliary Body.

Functions : When the muscle contracts, it pulls the Ciliary Body forward and towards the centre. In this way the Suspensory Ligament is relaxed.

The Retina : This is the innermost layer of the eyeball. It is an



FRONT SECTION OF THE EYEBALL

extremely delicate and sensitive layer situated on the inner surface of the Choroid. This serves as a screen on which images are formed and their impressions conveyed to the brain by means of the Optic Nerve. It is an expanded outgrowth of the Optic Nerve. The points where the Optic Nerve enters is called the Blind Spot, as the images of objects falling on this spot are not perceived. Exactly in the centre of the Retina immediately opposite the pupil is another round spot called the Yellow Spot. At this spot vision is most acute.

When the Retina is examined under a powerful microscope, it is found to consist of five layers. Of these the most important is the innermost layer, which is composed of rods and cones. These are the structures which are sensitive to light and the sensitiveness of any part depends upon the number of rods and cones present at the spot. There are none of these rods and cones at the Blind Spot, whilst they are most numerous at the Yellow Spot.

The Chambers of the Eye : This Iris divides the interior of the eyeball into two chambers or apartments. The anterior chamber is filled with a clear watery fluid called the Aqueous Humour and the back chamber contains a transparent jelly-like fluid called the Vitreous Humour. This fluid is enclosed in a thin membrane, the Aqueous Humour. The Crystalline lens and the Vitreous Humour serve as the refractive media of the eye. They bend the rays of light entering the eye so as to bring them to a focus on the Retina and thus produce a distinct image.

Nature of the rays of light : Rays of light are either parallel, divergent or convergent. Rays of light coming from a distant object

are almost parallel and rays proceeding from a near object are invariably divergent.

A number of parallel rays passing through a convex lens converge at a point known as Focus.

Images formed by a convex lens: If both the surfaces are convex it is called a double convex lens. A double convex lens has the power of bending the light rays more so as to bring them at one point.

A double convex lens changes the divergent or parallel rays into convergent rays.

Accommodation : The Crystalline lens of the eye has the power of adjusting itself so as to be able to form images of objects of varying distances. The lens is elastic and has the power of varying its convexity. Thus it becomes more convex when an object is near and less convex when the object is at a distance.

Since the distance between the Retina and Crystalline lens is fixed and the distance between the object and the lens cannot be ordinarily altered, the lens change the convexity so as to bring the image of the object on the Retina. This power of the Crystalline lens by which it is able to form distinct and near objects is known as Accommodation.

How is Accommodation brought about ? The eye is normally so made that rays coming from a distance (more than twenty feet) are focused on the Retina without any accommodation. If the object looked at is less than twenty feet from the lens, then the lens bulges backwards to increase its convexity. This is brought about by the action of the Ciliary Muscles inserted in the Ciliary Body.

The muscles contract pulling forward and towards the centre of the ciliary body. The ligaments attached to the ciliary body and the capsule of the lens get loosened and the lens becomes more convex posteriorly. The nearer the object looked at, the greater will be contraction of the ciliary muscle and the greater the convexity of the lens. If the object is brought too near, it will throw greater strain on the ciliary muscle and thus weaken the muscle.

Binocular Vision : Binocular vision is the focusing of the images of an object on the two retinas of the eyes at their corresponding positions. This object is achieved in an easy way when the object is at a distance. But when the object is near, muscles of both the eyes have to work in close cooperation, so that convergence and accommodation always take place together in the two eyes. By looking at objects with two eyes we get a more distinct idea of the shape of the objects and their relations with surrounding objects is thus seen in detail and vividness.

Visual sensation : 1. The Retina retains an impression for about

1/4th of a second. This is made use of in the moving picture. The pictures move in a succession of the screen at such a speed that the image of a new one is formed while the image of the last one has not faded. Thus the objects present a life-like movement on the screen.

2. A lighted stick if moved rapidly round appears as lighted circle.

3. If we look at dazzling light for some time and then fix our gaze at a white paper we see a dark spot on it. This is because the Retina has become tired and invisible temporarily.

Errors of Refraction: Normally the eye is so constructed that rays coming from objects beyond 20 feet are parallel and are focused on the Retina without any effort of Accommodation.

Hypermetropia or Long-sightedness—Sometimes the distance between the Retina and the Crystalline Lens is less than normal or the eyeball is too short. The rays coming from distinct objects are focused behind the retina and produce indistinct vision. This effect is called the Hypermetropia or Long-sightedness. To correct this error use convex lenses or plus lenses in front of the eye. These lenses converge the rays and focus them on the retina.

Myopia (Short-sightedness)—Sometimes the eyeball is too long and the crystalline lens is too strong and the rays coming from a distance are focused in front of the retina. The image is, therefore, indistinct. The person brings the object nearer to his eye. This error can be corrected by putting concave or minus lens in front of the eye. The scattered rays are focused on the retina with the aid of such lenses.

Astigmatism—This error of refraction concerns chiefly with the Cornea. The cornea is uneven and not uniform in all its diameters with the result that some portions of the image are focused on the retina while other portions are focused either behind or in front of the retina. To remedy this defect, a person needs compound glasses i.e., convex and concave lens combined.

THE SENSE OF TOUCH

The Sense of Touch is the most widely distributed and the simplest of all the senses. It is lodged in the skin all over the body and in the walls of the mouth and the nasal passage. Its sensibility is due to the presence of Touch Corpuscles distributed over the Dermis of the skin and in the mucous membrane of the mouth and nose. In each of these Touch Corpuscles or Tactile Corpuscles a branch of a sensory nerve ends.

The corpuscles consist of a mass of connective-tissue and are situated in the Papillae or the tiny elevations underneath the

Epidermis. A nerve-fibre winds round each corpuscle and branches within it. It is said that there are more than 2400 papillae to the square inch on the tips of the finger.

All parts of the body are not equally sensitive to the sense of touch. This sense is most acute in the tip of the tongue, the tip of the finger, the tip of the nose and the lower lip, as the number of corpuscles is most abundant, and are covered only by a thin layer of epidermis. This sense is least delicate on the soles of the feet and the palms of the hands.

The points of a pair of compasses are used to determine the sensitiveness of the skin. If the points appear to be separate even though the distance between them is very small the sense of touch is very delicate and sharp; on the contrary, if the distance between the points is great and the points appear to be one, the sense of touch is least delicate.

Blind persons have a better developed sense of touch than others. They are able to read books by feeling a raised form of printed letters and can be made to learn a number of useful crafts like matmaking, knitting and sewing, etc.

THE SENSE OF TEMPERATURE

This sense is caused by the stimulation of special nerve endings. These are different from the Tactile Corpuscles. They are spread under the Epidermis. The parts most sensitive to this sense are the cheeks, the elbow, the tip of the tongue and the eye lids. The skin is not a good judge of the absolute temperature of bodies.

THE SENSE OF TASTE

The tongue is the organ of taste. It is a muscular organ placed in the cavity of the mouth. It is attached to the Lower Jaw by means of muscles and is connected behind with the Thyroid bone. Its muscles enable it to perform all the movements required in the work of chewing.

The tongue has a deep sensitive layer and an upper or surface layer. The deep layer is raised up into papillae. There are three kinds of papillae viz., the Filiform papillae, the Fungiform papillae and the Circumvallate papillae.

The Filiform papillae are long, pointed and extremely small structures lying on the front portion of the tongue. They are very numerous.

The Fungiform papillae are larger than the above papillae. They resemble a mushroom in shape and are spread over the central portion of the tongue. They perceive the acidic taste.

The Circumvallate papillae lie near the root of the tongue. They

are fewer but larger than the Fungiform papillae. They are arranged in the form of the letter V with the point of the letter towards the back.

The sensation of taste is caused by the stimulation of the taste-buds by substance in solution. This stimulation is changed into nervous impulses and carried to the brain by the sensory nerves. The fifth and the ninth cranial nerves are responsible for this sense.

There are four kinds of taste: bitter, salt, sweet and acid. They are felt through excitation of different taste-buds. The tip of the tongue is most sensitive to sweet and the back part to bitter taste. All other tastes are only mixtures of these four tastes.

THE SENSE OF SMELL

The nose is the organ of smell. The Vomer bone divides the nose into two cavities. Each cavity is called the Nasal. A spongy bone forms narrow winding channels and thus increases the length of the air-passage. There is a passage which sets up a communication between the nose and the pharynx. This passage is called Posterior Nares.

The cavity of the nose is lined by mucous membrane which is richly supplied by nerves and blood vessels. The upper part of each nostril is supplied with branches of the first Cranial or the Olfactory nerve. The Lower Twisted Bone separates the olfactory chamber above from the ordinary passage. This passage is lined with mucous membrane, but it does not receive any fibrils from the olfactory nerve. The mucous membrane is kept moist by a fluid which is secreted by it.

During an ordinary breathing the air flows along the lower nasal passages into pharynx. We sniff up when we wish to perceive a faint odour. By doing so the floating particles of odorous matter comes in contact with the nerves of smell.

The mucous membrane of the nose becomes dry and swollen during bad cold. So the air does not reach the upper part of the nose. Consequently no smell is experienced.

The Olfactory nerve endings are excited by particles of vapours reaching the cells of the olfactory epithelium and this stimulation gives rise to a nervous impulse which is transmitted to the brain. All smells are, therefore, due to the vapours and substances which do not give off vapours are odourless or without smell.

The Training of the Senses: The senses play a very important part in the educational process. Senses are the gateways of knowledge. Their proper training and development aid the child greatly in forming a right background for the acquisition of knowledge

throughout life. Montessori observed that senses are active between the ages of 3 and 7 and that a great deal of learning takes place during this period. According to her, no intellectual development is possible without the ability to make fine memory discrimination. She says that the attention of the child is attracted by sensory stimuli and not by thinking or reason. According to her, sense training prepares the child directly for education by perfecting the sense organs. She emphasizes the refinement of the senses so as to enable the children to discriminate better between the various stimuli that give rise to sensations of weight, colour, sound, touch and temperature and, thus they aid in exercising their judgment and reasoning. She stressed the importance of didactic apparatus for memory training.

The Endocrine Glands

The endocrine glands and their known functions may be outlined as follows:

The pituitary gland: The gland is generally recognised as the master gland of the body, in that it exercises some control over various other endocrines. It is only about the size of a pea.

It is a double gland, the anterior portion of which secretes tithelin which, if present in excess produces unusual growth and gigantism. *If the secretion develops after normal growth is about completed, the extremities of the body continue to develop and result in the condition known as acromegaly.* In its hypofunctioning it may create dwarfism with normal intelligence but immature development of the sexual organs.

The posterior portion of the pituitary secretes pituitrin, which regulates bodyfat and in its hypofunctioning produces obesity.

The thyroid gland: As already indicated, the thyroid gland is responsible for controlling the oxidation and heat production of the organism. It is located on each side of the larynx in the form of two lateral lobes connected by a narrow tissue.

The malfunctioning of the thyroid produces cretinism or myxedema depending on whether the condition exists from birth (cretin) or makes its appearance in adulthood (myxedema). The thyroid has lent itself to control better than have the other endocrines, although it is itself under the final domination of the pituitary gland already described. The introduction of thyroxin, initially extracted from sheep thyroid but now obtainable in synthetic form results in marked physiological improvement. It is not a cure, and if treatment is neglected the individual will return to his earlier physical condition. Thyroxin is 65.3 per cent iodine by weight; hence the introduction of iodine into the diet will relieve the development of goiter, common in regions where there is a dearth of iodine in

the ground and vegetation. Goiter is caused by the thyroid's efforts to produce sufficient thyroxine, and in the process of overworking, the gland becomes unduly enlarged.

Since it is possible to control much of the malfunctioning of the thyroid, it is not now common to see the physical results of a defective thyroid. The cretin may be distinguished by stunted growth, mental deficiency, subnormal body temperature, dry skin and hair, etc. The victim of myxedema may be fully grown but is low in basal metabolism and suffers deterioration of skin, hair, physical energy, and mental alertness.

The adrenal glands: The adrenal glands have two kinds of tissue, the cortex and the medulla. The cortex is essential for life; the medulla is not. The cortex secretes cortin which seems to have, via the pituitary gland, an influence on sexual precocity. In its hyperfunction the cortin hastens early sexual development and in adult women may cause secondary male sex traits. The hypofunctioning of the cortex is related directly or indirectly with low blood pressure, skin pigmentation, and physical emaciation.

We are already acquainted with the characteristics of the adrenalin secreted by the medulla and know that it is essentially the chemical stimulus for visceral, digestive, respiratory, and cardiac functions.

The thymus gland and the pineal gland: The thymus gland, located at the base of the neck, and the pineal gland, imbedded under the cerebral hemispheres, are both responsible for certain aspects of the growth and development of children upto the time of puberty. Their activity is antagonized by the gonads, and both glands atrophy following puberty.

The gonads: The gonads produce the germ cells of reproduction and also secrete hormones responsible for the development of secondary sexual characteristics. In the male, the sex hormone results in the development of beard and lowered voice. In the female, the mammary glands develop, the hips broaden, and fat is developed under the skin. The gonads apparently function in opposition to the thymus and pineal glands. If the gonads produce the sex hormone, the thymus and pineal glands degenerate and secondary sex characteristics develop. But the secondary sex features do not develop if this hormone is not produced.

The pancreas: The pancreas secretes insulin, important in the manufacture of body sugar. Since 1921 when Banting and Best identified the active agent in sugar metabolism as insulin, it has been possible for people suffering from diabetes to obtain relief from the hypofunction of the pancreas.

The parathyroid glands: These glands are associated with the thyroid but are quite distinct from it in function. The hormone of

the parathyroids exerts a *quietening influence* on the organism, and the scarcity of this hormone in the blood causes overexcitability. In operations where the thyroid is removed, the surgeon is very careful to leave the parathyroids undisturbed to avoid severe tenseness and excitement in the patient. A superabundance of the hormone creates apathy and flabbiness in the muscles.

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INTERESTS : NATURE AND NURTURE

SINCE interest can be looked upon as the gravitation of education, its psychological components and sustenance are the major problems of teachers in the classroom. Among the teaching problems, the method of evoking the interest among children in their work is engaging the attention of every teacher. So, to get the children interested in the work and the method of presenting the material in good fashion, which is both educative and absorbing, are topics about which teachers are exercised. Teachers also want to know how to stimulate the students to study effectively.

The greatest aid to attention is interest. There is such intimate connection between the attention and the interest that, indeed, the two are being looked upon as so inseparable. Interest is coming more and more to be considered the feeling side of attention, or the affective accompaniment of attention. In the realms of consciousness, both co-exist. In its affective aspect, interest is a feeling, both painful or a pleasure, and is generally accompanied by attention. It is a common day phenomenon with all of us that wherever we show interest in a particular object, or a situation, we are paying attention also as a matter of course. But reverse is not the case because however hard we may try to be attentive in an object, or a thing, that will not generate interest by its count. So, it cannot be asserted with equal force that interest follows attention. Without interest, however, the attention cannot hold for a long time. To secure attention among students an effort has to be made to evoke their interest in the classroom.

Psychological Components of Interest

As said above, the concept of interest is primarily considered to be an effective one. The term is used to designate a concept pertaining to factors within an individual which attract him to, or repel him from various objects, persons and activities within his environment. The interest has the subjective and objective aspects. In the subjective sphere, the emphasis is on the feeling component and this fact is observed from observation of those who are highly

interested. In the objective sphere the emphasis is on the motor behaviour of the individual which is noticeable through an approach to and a choice of alternatives, which are equally available to the individual in so far as environmental barriers do not influence his choice. That the interests are relative is demonstrative through the fact that preferential hierarchy could be formed by an individual about himself and the same may not hold good for another individual.

Interests are held to draw their energies especially from three basic urges : the urge to activity, the sex urge and the urge for attention and approval. They develop within the limitations of the individuals, physical and economic environment and his physical and mental capacities and according to the pattern set by his culture. Within these limits, their development depends upon the extent to which they reach the consummation of success. From these considerations, application to education can be made which should be of distinct help in efforts to direct and control pupil's interests.

Psychologists and philosophers have attempted to define interest so as to evolve a definite inventory of criteria regarding its basic meaning. James, Mill, Herber, McDougall and others have spent a large portion of their writing in explaining the qualitative and the quantitative aspects of interests. One of the criterion of measuring interest among individuals was the amount of attention shown by them in a given operation. There being close relationship between the attention and the interest, it was assumed by such group of investigators that if attention was shown interest was present. But other concomitant factors, which also operate simultaneously on the individual during his aroused state of interest, are also contributive in the generation of this state of interest. Hence, interest, despite its close relationship, does not determine attention alone. The other criterion of interest, as adopted by vocational guidance counsellors, is the exercise of choice. Given many a choice, and all being equally available, the person is interested if he chooses one out of all the alternatives present. Attachment to an activity also presents the character of interest. If an individual persists over an activity for a long time, despite opposition and odds, he is said to be apparently interested in the task. However, in this state also, the matter of choice determines interest. If given more than one choice, the uninteresting behaviour should not persist and the choice would be made out of the alternative.

Conceptual dynamics of interest, if analysed, would bring forth three aspects of interest, namely, active, purposive and projective. Any individual, who displays interest in an activity becomes aggressively active towards it and displays all his concern and attention towards it. Any obstacle, or blockade will highly frustrate him and would evoke aggressive behaviour in case the obstacle is not

removed. Being active, he gets up and doing and energetic and thus shows a direction and propulsion in his behaviour which is finally focused on objects and ideals which have been holding his interest.

Interest may be looked upon as an emotional attitude which arranges our activities in a subjective scale of values. Subjective value is determined by the appeal which it makes to the subject.

The manifestation of conative aspect of interest in an individual is not a paradox. Being essentially of two kinds, interest could be direct or indirect, immediate or mediate. There must be an ultimate end for which the task is being performed. Children may take interest in things which are interesting in themselves and grown ups have to attend to a great number of things which are by themselves uninteresting, which become interesting because there is some motive external to themselves which makes them interesting. There is a transition from the direct to mediate and then to derived interest and this resembles the natural progression from involuntary to voluntary and to secondary passive attention. There is a great evolution in the process of interest. Firstly, interest is shown to natively interesting things. Since they hold temporary gains and are not highly socially sophisticated, a system of rewards and punishments, schools and other formal agencies fosters interest in a contrived fashion. Rewards and punishments displace the nativity in the interest and substitutes them with something which is more formalistic and socially rewarding. If this is considered as an operational emphasis of interest, then interests serve as a means to an end. And in this sense, schools may be considered as agencies of systematic elimination of interest. However, interests cannot be allowed to stay at their infantile stage and they have to be adjusted and geared to serve finer purposes of education.

Besides such variables like attention, vocational choice and persistence, which have been described as the criterion for the measurement of interest, other variables have also been employed to serve the same purpose—the measurement of interests. Differential remembering has been used as indicative of relative interest. Since learning is selective and since the individual, who is presented with a variety of situations, is in a habit to retain only one or a few out of all those experiences, the differential retention sets to operate. Positive relationship has been reported between vocational interest tests and information tests. The criteria involving and remembering are closely related to the criteria involving success and questions of abilities and responsibilities.

Tendencies, predispositions and mental biases which an individual displays are also indicators of interest. In this the individual will display his affective behaviour and will show great motivational activity in his sets.

Qualitatively, interest could be classified under various headings, such as social interests, vocational interests, intellectual interests, scientific interests, literary and musical interests, artistic, clerical and business interests and mathematical and medical interests. This is, however, a gross classification only.

Many researchers and investigators have studied the phenomenon of interest in terms of their duration, their extensity and their intensity. Duration would denote the temporal aspect of interest, extensity would be described in terms of the number of interests which the individual is showing and the intensity would denote the strength in the interest or interests.

In an individual, genetic constitution, his aptitude and his environment determine his interests. The influence of tradition and customs upon the growth of interest cannot be eliminated. Vocational interests, which grow out of aptitude of the child, are intrinsically genetic. The influence of sex upon interests has been studied. There is gradual change in interests with the chronological development of the child. It would be pertinent to note here that according to recent studies it has been found that interests and abilities appear to be independent variables and each one contributes in its own way to ultimate success. Interests have been found to be slightly suggestive of ability. The relationship between ability and vocational interests, as indicated by occupational choice, is perhaps greater than between ability and measured interests but this relationship is still small.

National customs and traditions, besides age, maturational level, sex and physical status also determine interest in the child. Family and home also set interest among children. Specific occupations are determined by parents.

Interest Inventories

Significant importance is attached to interest studies as they help in evaluating aptitudes in boys and girls. Significant symptoms of aptitude may be found in what a person says about his interests. Although interests may not always reflect aptitudes of a person because interests can also be imposed by authority, yet broad study of interests in depth do indicate about a person's inclinations. Vocational interests always correspond with the capacity of a person to perform. Interest at times is considered as a verbal expression of one's aptitude.

For studying interest, wide use has been made of paper-and-pencil blanks as interest inventories. Such methods serve as means of information about a person's preferences. Many interest blanks have proved to be among the best proved aids in counselling.

That all interest inventories may not lead to correct information is due to the fact that all interest inventories may not be highly

valid and reliable. Sources of inaccuracy in any procedure system are possible. Interest inventory is no exception. It is generally observed that what a person may say about his interest may suffer from chiefly three kinds of errors: *information errors*, the *generalization errors* and the *prevariation errors*. However, in spite of these errors, paper-and-pencil inventories have served and will continue to serve their useful purpose. Interest inventories have stimulative value and they have also informative value as well. The stimulative function of the interest inventory is seen from the fact that it encourages the person to have a thoughtful self-scrutiny in depth. The informative function is availed of due to the fact that interest inventories are specially constructed to obtain various informations regarding person's likes and dislikes.

Many interest inventories have been studied from various angles. Strong has ascertained the reliability of an interest score and its relative stability. Many psychologists have used interest inventories for other purposes as well. Manson's occupational interest Blank for women is similar to Strong's in purpose.

Measurement of interests has to be simplified. Results of tests have to be precise and significant. Interest inventories must be able to identify not only a person's specific likes and dislikes but also the major trends of interest. Thurstone has selected eighty occupations for a vocational interest schedule. His blank undertakes just one thing to measure the strength of each of seven relatively independent factors to vocational interest. This blank takes less time to administer. It is simple and convenient.

It is evident that one of the decisive tests of interest, as of ability, will be occupational try out. The degree of satisfaction which a person gets in his daily employment is for him quite as important as is his proficiency in it.

Researches have shown that the measurement of a person's present interests is a means to provide symptoms indicative of what his interests are likely to be in the future. Such an assessment throws light on four possibilities of the person :

1. It will indicate the probability of the actual work of the occupation that the person is considering well enough to identify himself with to follow it;
2. It will indicate the probability of finding himself among congenial associates with similar interest patterns as his own;
3. It will indicate the symptoms of his future abilities; and
4. It will suggest alternative fields of occupation which may not yet have been seriously considered.

Lot of work has been done on interest inventories. Various types of interest inventories have been invented. There are three types of interest inventories which have been constructed so far. The first type is constructed with the aim of assessing interest among elementary school children. The second type is utilised for assessing interest of secondary school students and adults. The third type is used for college students.

In children inventories, the aims are as follows:

1. To provide a workable means of identifying pupil interests for effective guidance purposes.
2. To provide a research instrument for a psychological study of children's interest.

At times, interest inventories have been criticised as being subject to "falling". A respondent may give only desirable responses although he may not have those responses in his interest patterns. It may be true. However, every question has to be replied faithfully by respondent. An interest inventory is essentially a means whereby the student can communicate with himself correctly and faithfully. It is felt that replies on an interest inventory are better than an unorganised introspection. By learning to answer honestly, a student is motivated to learn about himself. Instructions have to be made clear to students that the purpose of the inventory is to help them to know more about themselves. He is also told that there are no 'right' and 'wrong' responses in the inventory.

Boys and girls generally show concern about possible vocational choice and goals at the stage of adolescence. Vocational interest of the student depends upon the knowledge, attitudes, values, physical characteristics, etc. Knowledge of occupations is one of the ways of ascertaining realistic vocational interests. To help young boys and girls to understand blanks fully, many psychologists have attempted to define interests as preoccupations, objectives, likes and dislikes and motives. William James discussed interest as a form of selective awareness or attention that produces meaning out of the mass of one's experiences.

Another psychologist Berdie has viewed interests as factors that attract individuals to or repel them from objectives, persons and activities. The operational or experimental approach generally used in the assessment of interest involves a study of the individual's likes and dislikes.

Strong speaks of interests as "likes" and labels "dislikes" as "aversions".

Interests can be plotted as patterns or profiles. They are located on a scale ranging from a non-interest or zero point to a high

positive value. This approach tends to omit the negative or dislike aspect of interest. With interest defined as an organic condition, it becomes evident and necessary to explore its formation.

Emergence and development of interest is also important to study. Children spend most of their activities in free play during their childhood days. They express their natural desire to explore the objects they encounter. An interest in fantasy is natural and is likely to continue for some time in the highly imaginative child and in the child who lacks successful real-life experiences. Interest in fantasy frees the child from boundaries of reality and allows him an opportunity to explore the possible relationships and ideas stimulated by the host of concepts that have partially developed in him or her. Children's general interests are sometimes explored by providing an opportunity for them to express their spontaneous wishes. Expressed interests of children grow under as they have the opportunities to experience an ever-expanding range of activities. Chronological age has been the most frequently used index for studying and reporting interest. There is some evidence that maturity may be a more reliable index of interest.

Evidence of interest in the form of attention can be observed in the early behaviour of children. Stimulation awareness evidenced by movement of the body and fixation of the eyes with development of perceptions and conceptions; psychological components of interest become more evident.

Educational functions in students are largely determined by the attitudes, interests and values of pupils, teachers, administrators and parents.

Attitudes, interests and values have a dynamic interrelation with each other. They interact with all other elements of the organism rather than the static unit that they may seem to be. Certain behavioural characteristics are noticed as life experiences and from them could be inferred that an individual has a particular attitude, interest or value. A person's perspective, his interpretation of units and segments of experience as well as totalities and general outlook on life are generally affected by his interests and attitudes. Attention has to be given to the interests of pupils. Procedures for identifying those interests and ways and means of capitalizing upon them for instructional and vocational guidance is a necessary step in educational process. As interests are helpful in promoting learning, they are of major significance in determining learning situation. A person, who is interested, works harder, longer and more effectively.

Classification of Interests

Interests may be classified into four groups depending upon how information about them is obtained. Super has identified interest groups as follows:

1. Expressed interests.
2. Manifested interests.
3. Interests inferred from tests.

Expressed interests are identified by asking a pupil to tell or write about the activities, vocational and avocational interests which a person most and least enjoys.

Manifested interests may be identified by directing and observing the pupil or by finding out about his hobbies and other activities.

From tests also, interests can be inferred. *Inventories are Interests* that are measured with standardised instruments which require a person to choose from a large number of activities.

Interest in an object or in an activity reveals itself a heightening of attention to it. The interested activity is entered upon with promptness and zest and is continued even beyond the stage of excessive fatigue. The outward manifestations of interest are concentration of attention and persistence of activity.

As has already been referred to above, an interest is a tendency to become absorbed in an experience and to continue it while an erosion is a tendency to turn away from it to something else. Both interests and aversions are dynamic. It is the nature and strength of these tendencies which have meaning for educational and occupational plans. Interest is defined, therefore, not only in terms of the objects and activities which get attention and yield satisfaction but also in terms of the strength of the tendencies to give attention to and seek satisfaction from these competing objects of interests. The outward and visible signs of interest are generally obvious in the behaviour of the interested persons. As interest wanes, attention wanders, or is held only with effort.

It is, therefore, evident that interest and aptitude are related. The capacity for achieving an interest in carrying on the work of any occupation is, then, a vital constituent of aptitude for it. A person is inclined to enjoy doing what he can do well. His vocational interests do tend in some degrees to correspond to his potential abilities.

Measurement of Interests

Interest has been proved to be more amenable to measurement than the measurement of personality. Many instruments have been instructed to measure different interests among individuals. Tests and scales, with a real psychological content and constructive and intelligible psychological meaning have been produced. Some of the instruments employed in the measurement of interest are given below:

1. *Interest questionnaire for High School students* (reference : Symonds). In this questionnaire there are 68 items indicating liking, indifference, or dislike. The questionnaire can predict success in the curriculum of the subject's choice more accurately than it is predicted by a general intelligence test. The instrument is carefully and competently constructed.
2. *Strong's Vocational Interest Blank*: This blank lists 100 occupations, 38 amusements, 36 school subjects and contains 46 items having to do with types and peculiarities of people. Responses are scored in terms of L (for likes), D (for dislike), I (for indifference). Self-rating of preferences, habits and traits are also solicited. Generally, this Blank has been found useful when combined with other criteria.
3. *Vocational interest for women* (Strong): This has been particularly constructed for women and follows the same technique of construction and the same general organisation as are embodied in the Vocational Interest Blank for men. It includes references to 17 occupations and the traits of masculinity-femininity. The blank has been standardised on mature women. Its applicability is, therefore, limited.
4. *Kurdar Preference Record*: It consists of 14 sets of 3 choice items. There is no time limit, but the time required is usually about 40 minutes. Scores are classifiable into nine areas: mechanical, computational, scientific, persuasive, artistic, literary, musical, social service and the clerical. The Preference Record has been shown to be reliable enough for counselling. Other interest inventories, which have also been developed are: Occupational Orientation Inquiry and Miner's Analysis of Work Interest. They have also been employed for studying and measuring interest.

Educational Importance

Teacher, in his teaching process, is primarily concerned with motivating his pupils and stimulating them to hard work. The presentation of material before the pupils in an interesting manner and of making it timely and absorbing are the problems of a teacher.

The reasons for the lack of interest in pupils may be manifold. Pupils may lose interest, or never acquire an interest in their studies for reasons that centre in the subject, in themselves and in the teacher. The cause of disinterest may be any one of them or most of them. Though a student, at the higher stage, should develop interest himself, younger pupils have to be motivated to work. The value of the threat of failure as a motive may also create disinterest among students. Qualities and characteristics of incentive and

motives may also boost or want the interest among the students. Intrinsic motive, economic motives and eagerness to reach goal also affect interest.

Use of audio-visual aids in teaching also arouses interest in the student. It helps successfully in capturing the interest and attention of students. The use of audio-visual aids is not to replace the teacher, as some contend, but to reinforce teaching and thereby enrich it.

Other means of arousing interest among pupils is to appeal to their instincts because instincts generally lay down the circle of interests; to repeat as it evokes interest; to introduce variety; to ensure secure interests; to behave sympathetically, and others. In class-rooms, where children are young, play develops interest. Data on reading, movies and radio make still clearer the development from simple and active interests in childhood to the sex-social interests of adolescence. They show also the ready-made vicarious satisfaction of fiction or may take the place of real consummations when major interests are blocked or starved in real life. They show how amusements in turn may modify, or stimulate interests.

Interest autobiographies emphasise the fact that interests are perhaps the most modifiable of all human traits. They are at the source of feelings—are vivid with feeling. They change, grow, according as they achieve success and approval, or are blighted by frustration and loss of status.

Thus, in a number of ways, interests may be used to facilitate learning. By applying the principles, discussed under motivation in the previous chapter, the teacher could transform schooling from drudgery to an exciting adventure. Teacher should endeavour to present the material to be learnt in an interesting and sometimes novel context. Sometimes, games could elicit interesting results. Further, the material should be meaningful to the child and should be goal directed. Finally, learning situation should be one in which there is simply opportunity for active participation of all pupils and the atmosphere in the class-room should be friendly and permissive.

However, in the end, one would like to mention the opposition which interest has evoked in the modern pedagogy. It is contended by some that if teaching is made too soft and too interesting, the learner may obtain a false and distorted view of life. Pedagogies would degenerate if subject becomes interest-centred. This is, to our mind, only a false meaning attached to the doctrine of interest. By making the lesson interesting, softness is not to be intended to be introduced among children. This is not the right notion of education.

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ATTENTION

ATTENTION may be defined as a process of attending to the stimuli. Stimuli strikes the sense and secures the attention of children. According to F.H. Bradley attention is a complex of sensations and ideas. Attention is both cognitive and conative process of mind. Wundt laid stress on its cognitive aspect. He held that the clear distinct consciousness of an object is attention. Maudsley, Ribot and Munsterberg stress the conative aspect of the attention which according to them is the act of concentrating the mind upon an object. So attention is both cognitive and conative. Titchener also laid stress on the fact that attention is affective as a whole.

Recently, considerable importance has been given to the process of attention. Works of psychologists in cognitive-perceptual psychology, physiological psychology, psycho-physics and behaviour theory have given added information on attention process. Some physiological psychologists have given mental sub-strata to attention process. Accordingly to the mentalistic way of thinking, attention is a function of neural sub-strate. The sense organs and the body as a whole are directed towards a stimulus object. It may constitute a motor aspect of attention. Attention process is normally activated by sensory stimulation. A sensory stimulus causes the sense organs to attend the objects appropriately.

Attention, in the earlier text-books, is considered as a process which gives conscious awareness to a person. This approach supported the viewpoint advanced by theories which emphasised consciousness of mental functions. Schools of psychology like structuralism and functionalism made use of this approach.

It is a common observation that attention is a necessary condition for any mental task. Attention gives a mental set or a state of alertness for a task to a person. Attention process in a person enables him to sense or perceives selected events, conditions or thinks about an event. The nervous network of the human organism is constantly bombarded by a series of stimuli. All stimuli cannot be

simultaneously channelled into cortex for interpretation. A person has to sift out the specific ones from others. This selectivity is essential for attention process. Adequate attention is imperative if one is to acquire clear, concise detailed information about phenomenon of attention. The observational powers of man are limited. By observing too many things at the same time, a person often overlooks significant events in a field. Learning to "pay attention" is an important part of observational training. One has to acquire efficiency in attention through regular training. One must acquire the habit of placing himself in a state of readiness to perceive the specific segment of phenomena that relates to his problem and to ignore other factors.

Because of the complex character of attention, psychologists have defined attention in various ways. In attention, however, problems of fluctuation and distraction are significant. Similarly, concentration of attention is also important as it helps in learning. Teacher has to do his best to make the students learn as to how attention could be secured.

Various schools of psychology have tried to give their respective emphasis on attention. The Gestalt psychologists regard any force of attention as extraneous to field forces which in their view, are dynamic factors in human activity. Behaviourists have, on the other hand, rejected attention process as a mere traditional mentalistic concept. Titchener, as the leading psychologist, was of the opinion that the task of psychology was to study conscious experience. He had obviously objected to the functional approach and preferred to study attention process by investigating what he called—"attensity" an attribute of sensory experience which was comparable to hue or loudness. By "attensity" he meant to convey the processes like clearness, vividness, prominence or insistence which had not to be confused with the clearness of a distinct view of an object, for a vague shape in indirect vision has high attensity, if it stands out above all else in our consciousness at the moment.

Attention, as a concept, has also been classified into free and controlled processes. This is similar to force and controlled association. In free attention, conceptually, there is no assigned task and the question is simply to find as to which of the stimuli will 'catch the attention' and elicit the selective response.

Selective factors operate in attention process. In attention, a person has to behave in a consistent and integrated fashion. Irrelevant or conflicting stimuli do not generally elicit good attention. They interfere with the proper course of attention process. One can attend to stimuli and external objects and events to one's own actions or to ideas. While attending to a visible object, one tends strongly to look straight at it. Eyes are focused and converged for clear vision. An object can be attended to with intensity. Similarly,

while trying to attend to the sound coming from an object, let us say a speaker, one tends to face and look towards the source of sound. It is also possible that one may close the eyes to shut out visual distraction.

A person can also interpret what another person is attending to form his motor adjustment for seeing, hearing, smelling, tasting or touching.

Perceptual process is important in attention. Detailed functioning of perceptual scanning can help in the attention process. *Discrimination* is essential in attention process. Without it, learning cannot take place properly.

Attention is an important mental process. It is a necessary condition for successful observation. Attention or attending is characterised by a mental set or an inner state of alertness which an individual assumes so as to sense or perceive selected events, conditions or things.

Nervous system is an important source of attention. Richness in nervous system ensures better attention in human beings. Constant bombardment of stimuli on eyes forces brain to attend to them and nervous network of the human organism attends to these stimuli. Further, network of the human organism sends the stimuli to the cortex for interpretation.

Adequate attention is imperative if one wants to acquire clear, concise and detailed information about this phenomena.

It is a fact that the observational powers of man are limited. He may fail to perceive a phenomena accurately if his attention process is not functioning with concentration. Since observing several things at once is beyond the capacity of a person, he has to give specific attention only to one or two things at a time. In attention process, the factor of set is important. The learner has to be set for learning. The learner must pay attention.

The quality of attention is associated with the level of intelligence that a person has. Intellectually subnormal children appear to distribute their attention more evenly. It may be possible that this applies also to normal children at different age levels. Older children have learned to discriminate more aspects of the environment. They have also to learn to attend to some of these more than others. Young and retarded children may actually discriminate fewer diversions of an object or aspect of an event. They tend to attend to them in more random fashion. They are more easily distracted.

Attention and blinking have to be differentiated. A blink lasts a definite time, and while the rate of blinking may go up and down within wide limits, the time for which the eyes are closed for such belief is less variable. If a novel object is presented, blinking may

be temporarily suspended while the object is examined. The longer the visual task is continued, the more likely blinks are to appear. When a sequence of events has occurred repeatedly, there are two other mechanisms which allow blinking to take place without impairing efficiency. A driver, in heavy traffic, where he is expecting to receive critical signals shows a low blink rate. The same driver in the open country when he knows it is safe to close his eyes occasionally shows a higher blink rate. These illustrations show that the arrival of information predicts the influence of occurrence of blinking.

Factors Determining Sustained Attention

There are many factors that determine attention process. Some of the factors which help attention are:

1. Firm body support,
2. Darkness,
3. Quiet atmosphere, and
4. Regularity.

Applied psychology has worked hard to find conditions which can promote attention. It helps in business. The different methods applied to advertising problems have given fairly concordant results. One significant fact is the effect of the position. It is seen that the upper half of a page gets more attention than the lower half, and the left half more than the right half. Upper left-hand quarter may be three times as favourable as the lower right-hand quarter. Other factors that promote attention are:

1. Colour: Colours have usually been found to have some value as a means of attracting attention.
2. Isolation: The use of blank space framing a picture also helps in attention,
3. Curiosity,
4. Sex interest,
5. Desire for security, success, prestige, and
6. Amusement of interest.

Psychologists have used the above methods from time to time for securing attention of the public. The above factors have been found to have relative attention value appeal. To catch and hold attention is a very practical problem for the advertiser in any medium, for the safety engineer, for signal engineer, for museum director, for the headline writer, for the make-up editor of a newspaper and for the teacher, etc.

Fluctuation of Attention

Attention is not steady or concentrated throughout on a task. The length of time we can attend continuously to a single object in consciousness has been subject to experimental investigation.¹ Attending to a single stimuli without getting distracted is a myth. Attention gets diverted into different channels on its own count. Recourse to a very weak stimuli has been used for measuring the changes in the attention. Ticking of watch has been used as the weak stimuli. However, in addition to the stimuli other stimulations such as faint touch and faint visual stimulus have also been employed.

Various investigators have explained the phenomenon of fluctuation of attention with different approaches. Some have advocated peripheral theories and others have used central theories. The former postulate some condition of the sense organ as the explanatory factor and the latter attribute the cause to the nervous centres. However, on experimentation with different subjects and with different stimuli, it has been found that the peripheral theories seem to be of little validity. Although nothing conclusive is yet available, it is presumed that the central theories have quite substantial argument in their explanation which has been indicated also through experimentation.

Distraction and Attention

There are a number of differences between the child and the adult in the matter of attention. The child's attention is omnivorous and it is distracted by everything and does not run on one line. His capacity for holding things in the mind is small and the size of the individual unit that he can hold is also small. Naturally, the effect of distraction upon attention is of considerable interest. It has been found experimentally that in some cases, distraction is deleterious and in some it is not. It has been found that distraction also helps in the increase of output. From this viewpoint, the distraction may be considered, as an incentive leading to increased attention to the task. The individual seems to defy all the distractions and exploits his energy reserves to accomplish the task.

However, distraction does not result in better output for all types of individuals. For some persons it may be impossible to work in a state of distraction, but for some it may be a conducive factor to better work and output. If the distraction is slight and continuous the organism learns to adjust to it by accommodation and in this case it may not prove detrimental to him. If it proves too violent in character, it may accelerate the onset of fatigue and

1. Quoted in : (1) *Experimental Psychology* by Woodworth, (2) *Experimental Psychology* by Colling and Drever, and (3) *Experimental Psychology*, by Valentine.

may ultimately cumulate, which would finally prove detrimental to the organism and to his mental health.

Concentration and Learning

In order to seek concentrated attention, considerable energy is to be expanded. Concentrated attention needs as a great purposive activity of mind-set. And a definite intent to learn is necessary for learning with concentration. Intensity of interest and will to learn are basic to efficient learning. In many situations little learning occurs because no active attempt is made to learn. In many of life's situations the will to learn results in the acquisition of facts. Knowledge of the meaning of the subject-matter helps in learning. It has been noticed that students do not concentrate fully on the work of the class more than one-fourth to three-fourth of the time. Attention varies greatly, according to the effectiveness of teaching and the motivation of the students. There are many conditions that may cause attention to vary. Teachers and their mode of teaching, topics taught, period of teaching, health of the student, mental state of the learner and the educational problems that are being solved determine attention.

Teacher and Attention

In order to render learning effective, the teacher has to ensure condition which would sustain the attention of students. Broadly speaking, the conditions of attention may be conveniently divided into two main groups: subjective and objective. In the subjective attention, attention is determined by interests, dispositions and prevailing tendencies which the teacher has to exploit. In the objective attention, attention is wholly determined by some external factor in the stimulus itself and attracts the organism through sense organs.

Many school practices go against proper attention. Poor physical conditions are sometimes responsible for inattention. The school, its general surroundings and the condition of its rooms are not often conducive to concentration. Distraction sights and sounds are not eliminated. Noises should be eliminated and the opening and closing of doors and windows should be regulated.

The teacher himself should be an embodiment of attention inducing device. He should hold a position in the class-room in such a way that his manners and gesticulations should not be disturbing. He should not also pace in the class-room like a lion in the cage and should not indulge in dramatic poses. Pictures should be properly hung. The unruly pupil should be often stopped to create disturbance in the class-room. Ventilation of the rooms should be attended to. Postures, which are fatigue creating, should be corrected among students. The poor mental endowments of pupils, their weak, obstinate and indolent wills and their lack of mental alertness intellectual quickness and interest are also responsible for inattention.

Other undesirable school practices, such as whispering, public punishment and negative directions create distraction, which are still practised and which should be stopped.

Methods of Securing Attention

The following methods should be adopted to solicit the attention of students in the class-room.

1. Learning should be rendered stimulating. This could be done by creating proper apperceptions and mental sets in students. The new should be joined with the old and thus apperceptive attention should be secured. Novelty and familiarity should be created in the lessons.
2. Introduction of change at appropriate time is also conducive to attention. The lesson should present different aspects to the learner.
3. Practice of repetition, when required, should be resorted to. However, injudicious repetition may not yield attention because indiscriminate repetition may bring monotony and may thereby produce inattention.
4. A good time-table should be introduced in the class. In this all the considerations of fatigability should be allowed, and it is a great aid to attention. Attention should be distributed over the several subjects and specialisation should be framed in such a way that subjects demanding mental freshness should be placed first on the time-table than those subjects which require less attention.
5. Teaching methods adopted by the teacher should be such that they evoke interest in the subject-matter. The teacher should question inattentive students and call for collective answering. The routine should be broken, recapitulations undertaken, illustrations and examples introduced.

Other practical suggestions for securing attention are as follows:—

- (i) *Preparation*—Teacher and students must prepare themselves for the lesson well and in advance.
- (ii) *Clear assignment*—Definite and clear tasks should be given to students.
- (iii) *Audio-visual aids*—Teacher should make use of the visual aids as frequently as possible.
- (iv) *Participation*—Mutual participation in the lesson should be ensured in the class-room.
- (v) *Worthwhileness of the subject-matter*—The teaching should

be such as to relate the subject-matter at hand to the actual life situations.

There are certain motor concomitants to attention. Attention is the subjective correlate of adaptation or adjustment to a situation. It is often noticed that when attention flags, it can be brought back by changing postures and places and by making pupils stand. Hence, the motor concomitants of attention.

Attention and Interest

Attention depends on interest in its objects.¹ Some objects naturally draw attention. But the natural interest of objects is not enough. Attention also must have the tendency towards being attracted by them. The chick's interest in small objects impels it to attend to and peck at them. But gradually it learns by experience to avoid obnoxious small objects and attend to palatable ones. The disposition or instinct of pecking at small objects leads the chick to attend to them.

Affection or the feeling of pleasure and pain seems also to be a drive of attention. The hedonists claim that the feeling of pleasure and pain is what is meant by interest. Pleasure positively draws attention, while pain does it negatively. In other words, pleasure drives us to attend to its object in order to get rid of it. Yet feeling alone cannot be the drive of attention. Feeling is passive and subjective, while attention is active and objective as well. So the former cannot be the adequate cause of the latter. Interest is no doubt toned with feeling. But interest is also active or conative in the sense that it is a tendency towards action. Feeling does not prompt but passively draws us to act. Moreover, intense feeling makes attention of it impossible. There seems to be an incompatibility of feeling with attention, for feeling, as soon as it is attended to, disappears. So interest which motivates attention is not merely affective but conative as well.

Some psychologists tend to identify attention with interest. They hold that to attend to an object and to have interest in it are two ways of expressing one and the same fact. But such identification of the two seems to be unjustified. Interest in an object no doubt compels attention to it. The newly hatched duck attends to and swims in water because it has a conate interest in water. Yet the converse is not true. It cannot be said that attention to an object is necessarily due to interest in it. We do voluntarily attend to many objects in which we have no conate interest. For example, in maintaining our job we may attend to many objects devoid of any natural interest. One averse to arithmetic may have to go on adding and multiplying numbers. It may, however, be answered

1. Bhattacharya, P.N., *A Text Book of Psychology*, p. 270.

that even such non-voluntary attention to arithmetic is also motivated by interest. The primary interest in maintaining a job is earning one's own livelihood and arithmetical calculations being associated with it acquires a sort of derived or mediate interest.

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MEMORY

WITH the help of memory individuals remember important facts, real names and other items of information accurately. Memory gives them the impression of efficiency. Without Memory the person becomes lazy, inaccurate and does not remember things and finds it difficult to recall. Memory is the function of the mind by virtue of which it records, retains and produces ideas gained by its own activity.

Process of memory has been studied since very early days. Philosophers in Greece and India were the first to initiate studies on memory. Philosophical approaches were followed by experimental and empirical studies. Work by Ebbinghaus is of special interest to the students of psychology. Memory functions of normal as well as abnormal subjects have been studied in detail during the last 50 years. Workers, interested in fundamental laws and theory, have generally worked both on animals as well as on human beings. Different workers have given different emphasis to study the process of memory.

Adams has defined memory as a "learned capacity for responding, and its persistence over time is measured by the retention test". Adams makes a distinction between memory and retention. He states that loss of retention may not mean loss of memory. This is so because loss in retention may be many factors. A learner may not be able to recall due to many factors. But it may not necessarily imply that events and information have been wiped out from his brain. Memory may also be affected by the quality of motivation in the person. Test and retention is not a fool-proof method of studying the efficiency of memory in persons. Adams defines further memory as "the states of a subject that give the capability for correct occurrences of a criterion response. There is an initial acquisition session in which the subject makes a discriminative response to a stimulus, followed by a period of time called the retentional interval when the criterion response does not occur."

From this quotation, it is evident that memory is a complex process and memory state in a person is dependent on many factors. These factors may belong to domain of human realm as well as to the environment in which the person lives.

Efficiency of memory process has been generally studied in terms of two variables by the experimental psychologists. These two variables are: recall and recognition. Dependence on these two aspects of memory functions is largely due to the fact that recall and recognition can be studied objectively and can be measured in discrete terms. There is less of vagueness in the measurement of these two functions. Recall may simply imply the exact reproduction of the stimulus. Recall implies the reproduction of the stimulus. Recognition involves basically the process of identification. For testing memory, both processes of recall and recognition have been used by experimental psychologists for a long time now. They involve two basic functions of memory. Both, in their totality, give evidence of the quality of memory. Studies on clinical and normal cases have demonstrated that memory process is not a mechanical or a routine process. It is a dynamic process. Studies by Freud on abnormal cases have shown that failure of memory process may involve psychopathological factors, scientific investigations on memory have demonstrated that unconscious factors may also play considerable part in affecting recall and recognition processes in persons. It would be, therefore, not correct to reduce memory process to habits alone. Memory function cannot be relegated to retention interval. Learning state is not a mechanical state of mind. While behaviour psychologists may tend to define memory in stimulus-response pattern and in systematic association of reinforcing events. A dynamic theory on memory will tend to give a wider meaning and significance to this psychological process.

Many inferences have been drawn regarding memory functions with the help of learning theories. Various learning theories have advanced different constructs on the learning process. Different learning theorists have also emphasised different influences which activate a memory process. A memory investigator, working within Hull's theory, would tend to associate memory with habit states. Other theorists would likewise make different assumptions and premises on memory functions. Since memory is psychodynamic in character, the quality of motivation in a person will influence it considerably. Effect of motivation on memory cannot be denied. Motivation and learning are also closely associated. There is a pragmatic relationship between the two. In order to study memory process without any prejudice or passion, no exclusive theory can give us whole truth about its mechanism. It cannot be viewed on exclusive terms. Some theorists have explained memory process on habit changes. Some have explained it in terms of learning models. Some have explained it in terms of reinforcement

theory. These supporters have asserted that the force of reinforcement results in an increment of habit, or memory trace. Lack of reinforcement will result in weakening the process of memory. Since it is not very fully and conclusively known as to how habits are formed, the specific nature of reinforcing operations is said to be still a mystery. Till such time when all details regarding physiology and psychology of reinforcement theory or those of learning theories are known, much exactitude on the memory process cannot be claimed.

Theories of Memory

Various theories have been advocated to explain the process of memory. Each theory used has definite concept-structures to explain its mechanism and dynamics. A brief discussion on them is given below. Reference is taken from Adams. For a detailed discussion, readers are requested to refer to his book entitled "Human Memory".

(1) *Trace Decay Theory*

In this theory, the processes of retention and forgetting are emphasised. According to Adams the basic assumption of trace decay theory is that "habit spontaneously decays the retention interval and that forgetting is a result of a weakened trace at the retention test. This theory is supposed to have intuitive appeal. But psychologists and experimental workers feel that intuitive approach cannot be entirely scientific.

Works of Tolman, Conrad and Brown tend to support this theory. But work, undertaken by McGeoch, have opposed this theory. McGeoch does not agree with Thorndike's law of disuse. According to the author, McGeoch contends that interference is more compelling as an explanation of forgetting. He recommends a better treatment to this approach.

Some psychologists feel that trace decay theory can very well explain the phenomenon of forgetting. Experimental work needs to support this assumption. A theory on memory has to explain retention, forgetting and interference on better terms and provide a convincing explanation on the mechanism of memory.

(2) *Theory of Memory Permanence*

This theory states that memory traces are registered in brain on permanent basis. Forgetting, according to this theory, is caused due to certain inhibitions which operate in the brain. It also states that memory trace is potentially available for utilisation. Type of nervous system in human organisation will determine the quality of traces of human brain. Memory can be revived when forces of inhibition are reduced or eliminated. Experimental work has already

started to test the veracity of this theory. In particular, psychoanalysis has explained forgetting due to certain motivating factors that operate beneath the unconsciousness. Some of the modern learning theories have also emphasised the permanence of habit. According to supporters of this theory, learning refers to a more or less permanent change in behaviour which occurs as a result of practice. More experimental data will be required to confirm the validity in this theory.

(3) *Compartment Theory of Memory*

This theory refers to memory process in terms of short-term or long-term retention. Memory has been, thus, divided into two compartments. Forces of reinforcement can transform range in memory process. Short-term memory can be improved with practice. Capacities required for learning short and long range material do not differ qualitatively. It states that information available on inferences also supports this theory. Short-term memory material can be moved to long-term material if reinforcement is added. Physiological states in persons can affect the range of memory. However, more experimental evidence will have to be collected in order to examine the veracity in this theory. Work is already going on in this field and results need to be awaited.

Factors of Memory

The factors of memory are four, viz., Retention, Reproduction (Recall or Revival), Localisation and Recognition. According to some psychologists learning also is a factor of memory. For example, Woodworth¹ regards it as its first factory for only what is learnt from past experience is retained to be reproduced later. But this view seems to be unjustified. Learning depends on sensation, perception, feeling, attention and interest, among other factors. It may be said that learning is a factor of memory for without it no memory is possible, similarly it may be pointed out sensation perception, etc., are also factors of memory, for it is not possible without them. So it is better not to regard learning as a part and parcel of memory.² Retention, recall, recognition and localisation constitute the factors of memory. Each of these factors³ is separately explained below:

(a) *Retention*: Sensation and perception are the acquisitive processes of mind, for it is by their means that the mind acquires the materials of knowledge. If the acquired materials of knowledge are destroyed no sooner than these are acquired, knowledge does not develop. Knowledge develops if these materials are preserved or retained in the mind in the form of images. Retention thus is the

1. Woodworth, *Psychology* (13th Edition) Chapters 9 and 10.

2. Bhattacharya, P.N., *A Text Book of Psychology*, A. Mukerjee and Co. Pvt., Ltd. Calcutta, p. 129.]

3. *ibid.*, pp. 129-30.

preservative factor of mind. Whatever touches consciousness leaves trace or impression and is retained in the mind in the form of images. Whenever a stimulating situation occurs, retained images are revived or reproduced to make memory possible.

(b) *Reproduction (Recall or Revival)*: Retention of the images of past precepts is not enough for the purposes of memory. The retained images must also be reproduced, recalled or revived in mind. Reproduction is made possible by the action of a stimulus or a suggestive one, which represents the images of past experience in their original order, arrangement and relation. The relation among images by virtue of which a stimulus can reproduce them is called association. The association of images is governed by a number of laws. These laws are called the Laws of Association.

(c) *Recognition*: Again, the mere retention and reproduction of the images of past precepts do not exhaust the factors of memory. Recognition of the revived image as the image of its past precept is also essential to memory. In other words, memory involves cognising over again the image reproduced as that of a precept which was cognised in the past. It must bear on itself the stamp of familiarity. The past precept may be correctly reproduced by its image. Yet if it be not marked or recognised as the reproduction of past experience memory fails of its purpose.

(d) *Localisation*: Lastly, localisation of the reproduced image in time and space or its reference to the date or time when and to the place or situation where its corresponding precept has its locus, is also a necessary factor of memory. The image which is revived in memory is the image of some precept known in past experience. The precept, again, is an event in time and an object in space. The recall of the image then involves also the recall of the spatio-temporal setting of its past precept. As Titchener says, reproduction is not attended with the feeling of familiarity which is of the essence of recognition. A man seen at a distance appears to be familiar. This seeming recognition gives place to a sure one, when the time and the place or occasion where he was known in the past are revived.

So the factors constituting memory are retention, reproduction, recognition and localisation. Memory, therefore, means the process in which the effects of past experience are reproduced, recognised and localised.

Factors Aiding Memory

Practice improves methods of learning. This is true even if our methods have not been the best. The class of material, which has been practised well, is recalled easily. We must also use various senses to improve our recall. We should examine ourselves. The use of visual memory and auditory imagery are helpful in memory process. The use of the other types of imagery, such as those of taste

smell and experience of touch should also improve memory. Memory is all the more rendered effective if all these images are blended usefully and effectively.

Concentration in learning is also conducive to effective recall. Concentration should mean careful and it involves an active process. In exercising concentration, things like finding similarities and comparisons in relations assist the process of recall. Will is essentially involved in concentration. Unless we will to learn and furthermore, unless we attend to what we are memorizing, it would constitute largely wasting our time. An hour's concentration is worth more many times than period of wandering attention. Establishment of meaning among the things memorized serves to prompt recall. Similarly, things, which have immediate and proximate meaning to us, are also learnt promptly. Development of interest is necessary and it is altogether fundamental to memorizing. Interest also explains the specialisation of memories and persons, who are passionately interested in anything, memorize that thing in particular with great efficiency. Lack of interest would lead to forgetting.

The 'Whole' method Vs. the 'Part' method

Various facts and material that need to be retained require not only meaning, attention and interest by the learner, but also require the way or the method of learning. Repeated explanations and experimentations have proved that the best way is to adopt the 'whole' method. The whole method of learning is more effective when material learnt is to be large. In the 'whole' method of learning, rapid progress is not seen immediately. But the ultimate benefits are much more. In this method, the grasp of the subject-matter is more thorough than otherwise. In the 'whole' method of learning, the various relations, helpful to fix the parts into their context, operate by themselves. This establishment of context helps to memorize and aids in the recollection ultimately. This method can be applied to general reading. In starting a book, we should first take a general survey. The introduction or preface should be read to provide general concepts of the treatment of the subject-matter. In the 'whole' method, the material is closely related and interrelated.

The 'Recitation' method

An attempt to recite while the subject-matter is learnt is also helpful in memorization. Contents should not only be simple to be read and re-read in order to get memorized, but they should be recalled as much as possible each time. Special attention has to be paid to those parts which have to be recalled. Recitation acts as a spur. It encourages us to note various points much more effectively and quickly than we otherwise should. Quicker emotional response is also evoked in the use of this method. If we succeed in recalling

as much as we hoped, there is immediate satisfaction because it gives us the hope of success. Recitation also creates self-confidence. When we recite, we recall without any help from the outside, and thus in attempting to recite, we recall as much as possible without help. As against it, in regarding, which is a passive stage, reading and rereading may be simply monotonous.

Experimental Methods Employed in Memory

The experimental methods employed in investigating permanent memory are three in number.

1. The Learning and Saving Method

Here, the series of material are shown in regular rhythm. The attempt is made to reproduce the material. If unsuccessful, series are shown again till they are learnt. This constitutes the learning period. After some time, this series is reproduced and if errors occur, relearning must take place. Economy in repetition this time constitutes, the saving.

2. The Prompting Method

In this method, prompting is used in order to ensure complete reproduction.

3. Scoring Method

In this method, the number of correct reproduction constitutes the curve. The time taken by the subject to recall the second number of each pair is ascertained. This is known as the scoring time.

Forgetfulness

Memory is usually regarded as an asset and forgetfulness as a liability. Forgetfulness is a great problem and evil of life. Unnecessary things may be forgotten, but not the necessary ones.

Cause of Forgetting

The detailed description of the cause of forgetting is given below:

(1) More time-gap separating learning and reproduction is not by itself the adequate cause of forgetting. Rather, what occurs in this time-gap or what is known in this interval interferes with this prevalent materials and causes their forgetting. (2) Besides, similar and dissimilar objects of our daily life interfere with and inhibit the memory of each other. The interference of materials experienced later with those experienced earlier is called retroactive inhibition. The mind needs rest after learning something. Rest consolidates

learning. In other words, if learning be followed by rest, its assimilation continues in the subconscious mind. Such rest after learning is called the incubation period, during which the traces of past experience are durably stamped on the mind. (3) On the other hand, learning of one thing immediately followed by that of another produces the opposite result. (4) Interference may cause brain-weakness or disease or, forgetfulness. Brain shocks also may cause it. Injury to the association area of the brain and senile hypocerebration may also inhibit memory. (5) Atrophy through disuse is another cause of forgetfulness. Inactive muscles weaken, for their substance is sucked by blood. Active muscles, on the other hand, draw their nutrition from blood. Similarly memory traces not used for a long time are atrophied or weakened gradually. Freud's view of the cause of forgetfulness deserves mention. Repression is, according to it, the cause of forgetfulness. Repression is a biological process, for it promotes self-preservation by safeguarding the mind against painful or uncomfortable experiences. Peace of mind is maintained at the cost of unpleasant memories. We remember our cheques but forget our bills. According to Freud, then, forgetfulness is voluntary, for it is due to unwillingness to remember. Moreover, Freud believes in conservation of memory. Nothing experienced is, according to him, really forgotten. Everything can be revived by the technique of free association. (6) Watson however, is of the opinion, that forgetfulness is caused by the absence of verbal association. Infantile experience is forgotten for the same reason. When language habit is active, memory of experience is possible, for then people can be told about them.

Remedies for Forgetfulness

The following steps⁴ may be adopted as a remedy for forgetfulness: (1) Care should be taken so that one known object is not interfered with by another. (2) Secondly, memory is inhibited when before its traces are consolidated in the mind, other traits of memory influence it. So rest is necessary after one learning process so that its traces get time to be consolidated in mind. (3) To ward off atrophy through disuse repeated practice of learnt or acquired objects is necessary. Activity in this direction prevents traces of memory from fading out and keeps them fresh. (4) To prevent painful experiences from being forgotten, their causes should be understood so that they may not be repressed and forgotten. (5) Lastly, overlearning is necessary for the purpose of guaranteeing memory.

4. *ibid.*, p. 147.

Selected Reading

- Bhattacharya, P.M., *A Text Book of Psychology*, pp. 128-153, Chapter 22.
- Boring, Langfeld & Meld, *Foundations of Psychology*, Chapter 8.
- Collins Frever, *Experimental Psychology*, Chapters 12 & 13.
- Garrett, H.E., *Great Experiments in Psychology*, Chapter 6.
- Tutoo, D.N., *A Text Book of Psychology*, Chapter 7.
- Mellone & Drummond, *Elements of Psychology*, Chapter 12.
- Woodworth & Marquis, *Psychology*, Chapter 27.
- Woodworth, *Psychology*, (13th Ed.) Chapters 9 & 10.

LEARNING

LEARNING is defined as modification *through* experience. It is also defined as the acquisition of behaviour pattern. It is the modification and coordination of the responses of the organism. Learning is essentially an active process. It is not a passive observation of knowledge. It is not the mere reading of books or listening to lectures. The learning is an enrichment of experience. In learning there is an interaction of the environment with the organism.

Learning occupies an important place in the school. Without learning all efforts of pupils as well as of teachers are bound to become purposeless. Learning essentially consists in the modification of reactions due to experience or practice. Every stimulation produces some change in reaction, for example,¹ in learning a poem for the first time, brain and intelligence do not react upon it easily as they do in the second, third or fourth repetitions of it. As the poem is learned again and again, the mental, physiological processes associated with learning are permanently organised. The learning of the poem is registered by the brain and intelligence. As the learning of poem is registered by the brain and intelligence. As the learning of the poem is continued, it gradually gives way to facility. Learning thus makes what appeared dull and difficult at first, easy and interested later.

Nature of Learning

There have been various approaches in studying the nature of learning. These approaches have been either experimental, in which experimental psychologists such as Thorndike, Hull and Skinner have worked to find out nature of learning process, or clinical in which clinical psychologists, psychiatrists and psychoanalysts have worked to find out the setting and satisfaction of learning situations. Whatever has been the method adapted in studying the nature of learning, it is essential to have a clear definition of learning so that

1. Bhattacharya. P.N , *A Text Book of Psychology*, A. Mukerjee and Co. Pvt. Ltd., p. 100.

learning as a concept, is not misunderstood with other concepts like motivation etc. In a broad sense nature of learning be defined as the process of acquisition of new behaviour, or strengthening or weakening of old behaviour as the result of experience with a view of modifying the behaviour. This process may involve many changes in perception and behaviour.

Learning, like growth, expands the possibilities of adaptive behaviour. Learning includes a wide variety of changes in behaviour. It may involve adjustment with others, or it may involve the learning of use of skills in day-to-day work, or inculcation of healthy habits. It may also involve the fostering of right attitudes or learning to control our emotions. What we learn is learnable only after we have reached an adequate level of physical growth and motivation.

Motives or drives are basic to any type of learning and to the learning process itself. Learning process involves some motives or drives on the part of learner and these motives or drives spring up a goal. In unfavourable circumstances, there may be a block to the attainment of the goal. For any effective learning, all these aspects in learning are essential. Performances that satisfy motives tend to be repeated and acts that fail to be gratified tend to be discarded. Entire learning situation is a very complex process as it involves individual variations in experiences, attitudes, abilities and goals.

Learning may also necessitate involvement of symbols. Since learning is a comprehensive process, it also involves the use of abstract concepts. It may take place at abstract level or at concrete level. All learning, as such, involves situations which may not necessarily involve physical and motor components of behaviour before the learner finally reaches the goal. In such a situation, learner manipulates and endeavours to find out suitable solutions to even somewhat dissimilar problems. In a symbolic and abstract form of learning, learner's past experience, his general ability and level of imagination determine the process in hitting out at the correct solution.

Learning curves and their typical contours in laboratory situations have shown that learning activity in a short time is likely to be very crude due to occurrence of accidental distractions, or temporary increase or decrease in motivation.

Learning involves various dimensions of psychological and mental activities. For the effective learning, among various psychological factors, motivation and learning ability are important factors. Besides psychological factors, there are physical bases of learning also. Since organism participates in activities which ensure learning on an operational basis, there are many physical plans through which an organism operates. On the physical plane, learning is highly dependent upon the receptors. The participation of

afferent nerves, which carry the sense impressions and participation of nervous systems, brain, spinal cord, glands etc., enforce the physical basis of learning.

Reviewing the forms of learning, it is observable that there are various ways in which the modification of behaviour involved in learning takes place. Thus, various forms of learning, namely, the development of skills, acquisition of habits, memorization, perceptual modification, enhancement in insightful behaviour, modification of emotional responses, alteration in attitude and ideas and the solution of problems are forms which are potentially useful in altering the behaviour and also in changing and improving it.

Learning, according to some psychologists, involves perceptual operation. Perception in the learning context refers to the acquisition of specific knowledge about objects directly stimulating the sense at any particular movement. In perception, objects are seen or interpreted in the light of pertinent experience from the past.

Learning involves motor processes, which include habits, ideational acquisitions which involve information, and affective elements which include emotions. Manual skills are relatively simple acquisitions and are dominantly motor in character. Characteristic constellations of ideational acquisitions are facts, meaning, precepts and concepts. On the effective side, we have a broad array of acquired likes and dislikes, biases and prejudices. On a still higher level of complexity and generality, there are value systems, 'frames' of reference and 'style' of life. The largest and most inclusive of these consolidations is what is termed as 'character' or the 'self'.

Theories of Learning

Several theories of learning have been advanced to explain nature of the learning process. A brief explanation on the salient features of the theories of learning are given below.

1. Thorndike's Theory of Trial and Error

Thorndike² regarded learning as a mechanical and blind process devoid of intelligent or conscious determination. He believed that an animal learns to reach the goal prompted by blind impulses. Learning, therefore, is a trial and error process. In the initial trials, there are large number of errors, but as trials are repeated the number of errors is gradually reduced. Finally there is no error and the result is success. Thorndike's theory of learning is thus based on trial and error.

2. Thorndike, E.L., *Foundations of Learning*. Columbia University Press.

Thorndike's³ Experiments

Thorndike's theory of trial and error is the result of his long investigations of fishes, chicks, cats, dogs and monkeys. According to him learning means the establishment of proper relations between stimulus and response. So his theory is known as connectionism or the bond theory of learning. Learning, he thinks, is a mechanical or blind process which proceeds on through making mistakes and correcting them. That is why his theory is also known as that of trial and error.

Thorndike has numerous animal-experiments on learning to his credit. But of these his experiments on the cat are classical. He confined a hungry cat in a puzzle-box with his favourite food fish placed at a little distance in front of the puzzle-box. Placed in this situation the hungry cat made varied movements or reactions. At first it tried to poke its head into the bars of the box or to stretch its paws out of it to catch hold of the fish or to scratch and bite the bars. All its attempts, however, proved in vain. But while trying and trying, its paws suddenly knocked against the pulley or latchet shutting the door of the puzzle-box, which flung open. Then did the cat come out of the box, have its food and satiate its hunger. In every successive trial the erroneous reactions of the cat decreased in number and the time required by it to open the door and have food was reduced. In the last trial the cat wasted not a second, but shot, as it were, at the food without making any mistakes. Now it can be said to have learnt to reach its goal. (Fig. 1 represents the result of this experiment.)

The diagram on p. 215 demonstrates the time required by the cat to reach its goal decreases gradually, though irregularly. This proves that its erroneous movements are gradually stamped out, while its correct ones are stamped in.

Criticism of Thorndike's Trial and Error Theory

Some psychologists⁴ have criticised Thorndike's trial and error theory on the following grounds:

(1) Firstly this theory is mechanical, for it leaves no room for end or purpose in any sense whatsoever. On the other hand, according to some psychologists like McDougall, even the behaviour of the amoeba or the paramoecia consists in learning to face novel situations to serve some unknown purpose. Even repeated trials

3. Thorndike, E.L., *Selected Writings from a Connectionist's Psychology*. Appleton-Century Crofts. 1949.

4. This statement is based on:

(a) Bhattacharya, P.N., *A Text Book of Psychology*. A. Mukerjee and Co., Pvt., Ltd., p. 106.

(b) Pintner and others, *Educational Psychology*.

(c) Hilgards, E.R., *Theories of Learning*. Appleton-Century Croft, 1948.

are of no avail if the tendency to learn is not there. Again, if the tendency is there, even one trial may be fruitful. McDougall and Woodworth insist on readiness or set for reaching a goal in learning and Lloyd Morgan lays stress on persistency with varied effort till the goal of learning is achieved. The hungry cat confined in the puzzle-box with food in front of it goes on persistently trying various means until it gets out of it and has food. So its trials are not blind and mechanical. They are, on the other hand, guided by perceptual attention and feelings of pleasure and pain. Yet Thorndike seems to attach no importance to these higher mental processes in learning. (2) Secondly, in course of repeated trials the

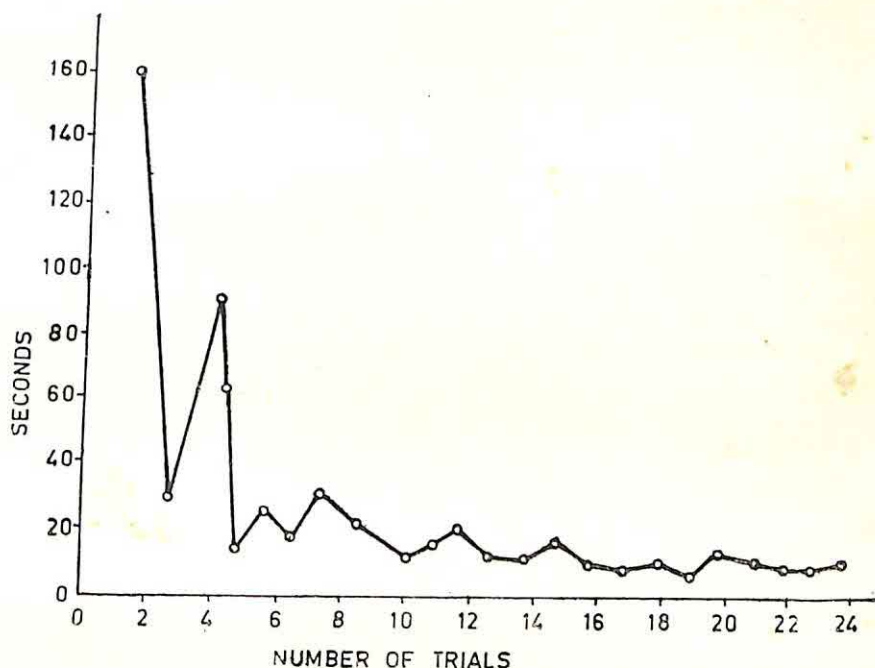


FIGURE 1
Curve of Learning

number of errors are not corrected of themselves or mechanically. The effects of trial and error depend to a great extent upon the *psycho-physical state of the animal* making them. In the absence of any purpose in view the animal is so puzzled, rather than enlightened by the errors committed, that it goes on blindly repeating them without end. In men also punishment is often found to consolidate his mistakes instead of correcting them, when he lacks the will or purpose of doing the same. (3) Thorndike presupposes that learning consists only in the association of several separate movements. But learning is a whole process related to a whole situation. The hungry cat confined in a puzzle-box with food placed near it does

not perceive the situation in a piece-meal fashion but as a whole of hunger-food-puzzle-box-confinement. (4) Lastly; the laws of learning formulated by Thorndike appear to be unjustified. For example, the Law of Effect seems to be inconsistent with his mechanical point of view. Satisfaction in or the sense of being rewarded by success and dissatisfaction in or the sense of being punished by failure seem to ascribe higher mental processes to animals like cats and rats than are psychologically ascribable to them. Or, it violates Lloyd Morgan's law.

2. Pavlov's Theory of the Conditioned Reflex

The doctrine of the conditioned reflex owes itself to the discovery of the Russian Physiologist I.P. Pavlov and his collaborators. If a piece of meat be introduced into the mouth of a hungry dog, the latter makes the simple or unconditioned reflex response of secreting saliva. Salivation is produced in this case due to the natural relation of the olfactory and gustatory receptor organs to the salivary or the parotid glands. So it is a simple or an unconditioned response. Now if a bell be sounded simultaneously with or before as many times as the dog is given meat, then after several trials the animal starts secreting saliva at the sound of the bell. This relation of the auditory receptor organ with the salivary glands is not natural or unconditioned but artificially conditioned by learning of experience. Pavlov's experiment may be shown as follows:

S ¹ or stimulus ¹ (meat)	R ¹ or response ¹ (salivation— simple reflex)
S ² (sound of the bell)	R ² (auditory response— simple reflex)
S ¹ + S ² (simultaneously presented)	R ¹ (salivation—repeated for several times)
S ² (sound of the bell)	R ¹ (salivation—conditioned reflex)

At the fourth step of the above experiment salivary secretion follows the sound of the bell as conditioned by its association with the presentation of meat. That is to say, it has become a conditioned reflex. If at the time of or before presenting meat to the dog a bell is sounded, then after several repetitions of the bell-meat sequence the unconditional salivary response to meat is produced by the sound of the bell itself. Similarly, any other condition of the presentation of meat repeatedly given to be associated with it comes to elicit the salivary response. For example, the very sight of the meat-server or the very hearing of his footsteps may produce the conditioned response of salivation. In every case a condition of the unconditioned stimulus comes to acquire the power of producing the unconditioned response of the latter in a conditioned way.

It is to be noted, however, that the conditioned stimulus has no power of its own by virtue of which it can produce the conditioned response without further depending upon the unconditioned stimulus. It operates by the power borrowed from the natural or unconditioned stimulus. If along with or after several soundings of the bell meat is not presented, then the flow of saliva is in the first instance reduced and in the next stopped altogether. This phenomenon is called the *Extinction* of the conditioned response. For this reason meat has got to be occasionally presented with or after sounding the bell even when the conditioned response has been established. This phenomenon is called *Reinforcement*.

Conditioned reflex is of various kinds. For instance, if meat is presented to the dog 5, 10 or 15 minutes after the ringing of the bell has continued, then salivation does not start as soon as the sound of the bell is heard but after the above intervals separating the two have elapsed. This is called the *Delayed Conditioned Reflex* because in it salivation is delayed. Another type of the conditioned reflex deserves mention. For example, if after the ringing of the bell has continued for some time and then ceased meat is presented, and if this experiment be repeated, then salivation does not start immediately upon the sound of the bell but after the time separating the stopping of the bell and the presentation of meat has elapsed. This salivary response is called a *Trace Conditioned Reflex*.

Just as an unconditioned reflex may be conditioned, the latter also may be brought back to the former being unconditioned again. For example, the salivary response conditioned by the sound of the bell may revert to its *unconditioned* form if meat is presented alone on several occasions without the ringing of the bell associated with it.*

Again, other psychologists like Bechterev and Watson considered learning as a conditioned reflex. A natural and non-conditioned reflex is a creation upon its natural or unconditioned stimulus but unnatural stimuli associate comes with natural ones, to elicit the response of natural one. A conditioned reflex is a reaction produced by a conditioned or unnatural stimulus. All learning consists in unknowing the unknown by means of the known or in the production of responses made to natural stimuli by means of unnatural ones. Below is given the brief description⁵ of Watson's theory of learning and conditioned reflex theory.

(a) *Watson's Theory of Learning*

According to Watson, learning can be adequately explained by the Law of Exercise or Frequency and the Law of Recency alone.

*For further and detailed explanation of the theory of Conditioned Reflex, see Bhattacharya, P.N., *A Text Book of Psychology*. A. Mukerjee & Co Pvt. Ltd, Calcutta, pp. 101-03.

5. Bhattacharya. P.N., pp. 107-109.

No aid of any mental concept should be evoked in the explanation of learning. The value of the Law of Exercise or Frequency is that successful movements outnumber unsuccessful ones; for every trial ends in a successful movement while it may not repeat the same unsuccessful movement. It is for this reason that repeated trials bring in success. Moreover, the successful movement is recent also for it is at this a trial ends. It is another reason why successful movements are stamped in while unsuccessful ones are stamped out.

Criticism: Thomson, on the other hand, criticises Watson's theory of learning. He attaches more importance to the law of effect than to the laws of exercise and frequency. Thorndike, himself also, considers these two laws as closely associated with the law of effect. Thomson points out that there is no guarantee in favour of the successful movement being most frequently repeated or exercised. Even an erroneous movement may go on being repeated. So according to the law of frequency only, it stands a fair chance of being stamped in. This, however, does not occur if the law of effect be emphasised. Secondly, if recency alone be the cause of learning then every prior unsuccessful or erroneous movement being recent would go on being repeated. Moreover, the successful movement being last in the series, is the most recent and so in subsequent trials no time should be wasted in the repetition of unsuccessful movements, as it is, as a matter of fact. Thus frequency or exercise and recency alone cannot be the adequate cause of learning. They must be combined with the law of effect. McDougall and Koffka, among other Psychologists have also criticised Watson's theory of learning as mechanical and distorted in nature.⁶

(b) Condition Reflex Theory

Pavlov and Bechterev, among other Russian scientists, on the one hand, and Lashley and Watson, among other behaviourists, on the other, have explained learning as consisting of conditioned reflexes. Simple or unconditioned reflex means response made to the unconditioned or natural stimulus, as the dog's salivation when its tongue comes in contact with meat or the child's fear-response to a loud sound. Now a bell sounded repeatedly when meat is presented to the dog comes to elicit the salivary response or a nice toy presented to the child as many times as a loud sound made comes to produce his fear-response. Both instances illustrate the conditioned reflex.

This represents the view that learning is a number of conditioned reflexes. This is true not only of the learning process of infra human animals but also of man as well, not *excepting the higher mental processes*. The researches of Pavlov, Bechterev among many

other scientists were confined to higher animals. But the researches of Krasnogorsky, *Matir* and *Lashley* were extended to men to prove that learning in their cases also is nothing but *conditioned reflexes*. The child's curiosity to know, for example, can be roused by new objects associated with habitual ones by experiment. For example, the child knows the bird, while it does not as yet know the word 'bird'. If the word 'bird' be repeated to him as many times as the child sees a bird, he learns this word with ease. Even higher processes of learning like the simple one explained, are conditioned reflexes, the former differing from the latter in being more complex. The principle of the child's learning the word 'bird' is the same as that of Newton's learning the force of gravitation or Sankar's learning Advaita-Vada, viz., *knowing the unknown in terms of or in association with the known*.⁷

Criticism: In criticism of the conditioned reflex theory of learning it is to be admitted as its merit that it seeks to explain learning without falling back upon Thorndike's law of effect. But it admits Thorndike's law of effect. And it also admits Thorndike's laws of exercise and its associate, the law of recency. The conditioned stimulus must be repeatedly presented along with the unconditioned one if it has to elicit the response of the latter. Again, the recently conditioned stimulus alone elicits the conditioned response properly, for after a lapse of time the latter tends towards extinction. Moreover, in experimental psychology the theory of conditioned reflex occupies an important place and it has revolutionised child learning. Before the advent of this theory the knowledge of the process of learning was vague. It rightly emphasises the *importance of association* in learning. It is now a psychological truism that child's learning consists in the establishment of *conditioned reflexes* through the formation of permanent habits. The intelligent learner can establish conditioned reflexes with facility, while the idiot cannot. Lastly, the theory brings learning under the teacher's control making desired learning conditioned by situations created or regulated by the experimenter.

In spite, however, of the above merits the conditioned reflex theory of learning is open to serious defects. It is, in the first place, a mechanical theory overlooking the learner's *interest attention* and other higher mental processes. Yet in default of these conditions this theory does not work. Learning depends largely upon the *learner's will, interest and attention*. Again, not all stimuli can be conditioned by unconditioned ones. For example, the child's natural love for the mother cannot, normally, be conditioned by the unconditioned stimulus of seeing somebody else, whom he naturally hates, associated with the mother.

3. Gestalt Theory of Learning or Insight Theory of Learning

Gestalt theory of learning is a new theory of learning. According to Gestalt, psychologists learning occurs neither as a result of trial and error nor as a conditioned response to unnatural or conditioned stimuli. It occurs on the other hand by insight into the whole situation to be learned. Learning does not carry gradually or step by step or trial after trial but suddenly by an insight into the learning situation as a whole. Kohler⁸ investigated the perceptual or learning process of chimpanzees or anthropoid apes in his laboratory in the Canary Islands. He observed that the random attempts at solving their problems suddenly terminated in insight. The chimpanzee exhausted in repeated trials at reaching bananas perhaps discovers a stick lying at hand or a blanket enabling it to reach them. Kohler's third experiment is more startling still. Bananas were hanging high up beyond the reach of the chimpanzee.

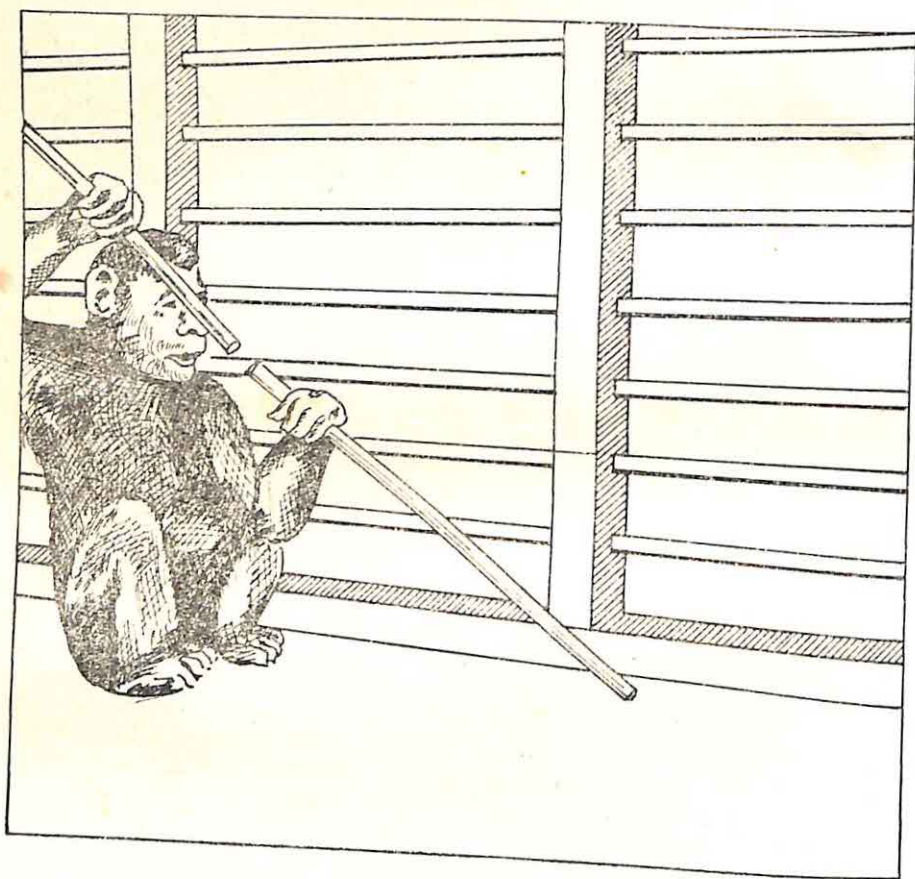


FIGURE 2

Fitting one stick in the hole of another, finally dragging the banana in.

He vainly tried to get to them with two sticks sported with them aimlessly for some time and all of a sudden fitted one stick in the hole of another, finally dragging the bananas in. (See Fig. 2)

Insight is a prompt and an instantaneous process. It does not occur slowly or step by step. Insight involves change in the arrangement of objects in the total perceptual field. Thereby the object in the ground becomes the figure of the perceptual field. For example, when the separate sticks unsuitable for reaching the bananas are the figure their relation to each other as related to reaching them is the ground of the field of perception. Insight, however, reverses this order to that what was the ground becomes the figure and what was the figure becomes the ground of perception. It occurs as a flash of lightning and sheds light on the problem as a whole. Insight is akin to invention. It is a sort of creative consciousness dawning upon the mind like an illumination which has, however, nothing mystic about it.

Criticism: In criticism of the Insight Theory of Learning let it be said on the side of its merits that it is fundamentally different from the two preceding theories. The latter are based on associationism, while the former is not. The latter takes the learning situation piecemeal, while the former takes it as a whole. The hungry cat confined in a puzzle-box with food placed near it, blindly making casual movements one after another till it succeeds in coming out of it and getting food by chance, is the typical example of trial and error learning. It is a hit-and-miss process continued till the target is hit by accident. The trial and error theory is, therefore, atomistic in character. Learning according to it, takes place by the permutation and combination of movements completely at the mercy of the laws of association. The theory of learning as conditioned reflex shares the same character. The insight theory of learning is, however, opposed to such psychological atomism. It regards the learning situation as an indivisible whole in which change of any part involves that of any other. It is not mechanical like the two preceding theories. It accommodates the higher process of mind like desire, interest and attention. But for that reason it is not unscientific. It is experimental, enriched as it is by the scientific investigations of Wertheimer, Kohler and Koffka among other Gestalt psychologists.

As to the demerits of the Insight Theory of Learning, it may be said that the theories of Trial and Error and of the Conditioned Reflex are not absolutely wrong. Insight, like a flash of lightning as it occurs, the ground for it must be prepared by trial and error. The chimpanzee which learns to pluck out bananas with two sticks joined together, does not do so instantaneously. This presupposes his trial and error with the two sticks manipulated separately. The

8. Kohler, W.H., *Gestalt Psychology*, 2nd Edition. Liverright, 1947.

9. Bhattacharya, P.N., op. cit., p. 111.

difference in the case of the insight theory is that even trial and error in it are governed from the very start by the perception of the situation as a whole. Moreover, insight is hindsight and foresight as well. It does not lie merely in perceiving the presented situation but also what precedes and what succeeds it.

4. Field Theory of Learning

Learning according to field theory is the *organisation and re-organisation of behaviour which results from many inter-acting influences* on the developing organism acting in its shifting environment. Field theory emphasises the phenomenon of perception and organism. They stress the fact that *a stimulus never occurs in simple isolation* and hence no simple explanation of learning processes is possible.¹⁰

In this theory, organising activity is more prominent than it is elsewhere. With numerous experiences, *the learners find the new into old and reorganises the old in terms of the new event and perceives significant factors involved.* All the problems are solved as soon as *the learner has achieved insight into their essential relationship* Generalization and differentiation are two interchanging activities which are operating in this process of learning. Due to generalization, the learner makes ordered sense of the multitudinous facts, feelings, attitudes and the like which he is experiencing or has previously experienced. In the process of preceiving, differentiation renders experiences as differential. Through differentiation, the learner selects from numerous experiences those clues which are most nearly appropriate and applicable to the solution of the new problem that confronts him. In this process, he perceives the significant differences between what he has previously encountered and what is later presented to him.

Meanings are refined and definitions are directed through differentiation. Details are seen in the larger context. Without the process of differentiation, learning does not become mature. However, like generalization, differentiation may have its own difficulty and may hinder the learner if he attends to detail and clings to minor differences at the expense of significant generalizations.

Insightful learning has full impact on the class-room teaching. The teacher should present the whole problem and evoke the cognitive and emotional readiness in the learner. Teacher should provide enough assistance to the learner for insuring success in learning.

It has been found that the mental disposition towards the task tends to strengthen or weaken the connections. In the case of

10. Lewin, K., Field Theory of Learning, in *41st Yearbook NSSE*. 1942, 41. (Pt. 11), pp. 215-242.

pleasant association between the stimulus and response, association persists longer but in the unpleasantness, the association is eliminated. In other words, feelings of satisfaction fix the responses whereas a feeling of annoyance tends to destroy it.

In addition to the accompaniment of feeling and affect, interests are evoked or subside in relationship to the outcome of the task. Annoyance will damp the interest towards the problem and satisfaction will boost up the interest. Success or failure, accordingly determines the learning in a person.

There is a close relationship between the law of readiness, law of exercise and the law of effect. Readiness and emotional effects influence practice. The relationship of success and failure to mental health has been seen to exist in the same way as in the relationship between the mind and the body. The emotional condition of the individual greatly changes by success or failure, which influence the end-products of learning. The emotional upheaval, which failure brings, or the emotional satisfaction which success brings, is significant for the child. Accordingly, it has been found that the praise, blame, reward, punishment and other factors determine the extent of learning in a learner.

The teacher has to make the subject-matter vitalizing and interesting. This brings the principle of effect into operation. A teacher, who is neutral and indifferent tends to be less effective in teaching than one who is dynamic and full of conviction. Injection of feeling and emotion in learning process is effective in order to render the learning effective. This being so, the character and personality of the teacher are of importance in rendering the lesson interesting.

In conclusion¹¹ it may be added that field, trial and error and the conditioned reflex involve wastage of time and energy in learning. Foolish people try to learn on at random without grasping the learning situation. These two theories emphasise and explain the mechanical process of learning of every day life. Intelligent learning cannot be explained by these two theories. The insight theory of learning is free from defects for it draws upon association by similarity and contrast as a whole because learning depends not only on association by continuity but by similarity. Trial and error learning and conditioned reflex learning rely upon contiguity. The insight theory realises both of similarity and contrast. Hence insight theory is more acceptable to us.

(5) *Skinner's Operant Conditioning Theory*

B.F. Skinner, essentially a behaviourist, developed a theory of operant conditioning. This theory, in fact, is an extension of earlier S-R theories propounded by Pavlov, Thorndike and Watson.

11. Bhattacharya, op. cit., pp. 104-105.

According to Skinner man is a machine and an automation. All the behaviour of man can be described in mechanistic terms. The basic thesis in this theory of conditioning is that an organism tends in the future to do what it was doing at the time of reinforcement. Skinner thinks that by bating each step of the way, the psychologist or experimenter can lead subject to do what he wishes it to do. On the basis of the experiment with rats, cats, dogs and pigeons, Skinner concluded that these animals can do simple acts through his "Skinner Box", containing levers and arrangements for delivering reinforcements. Same results have also been obtained on animals like monkeys and also on human children and psychotic patients. These species have exhibited the same process of learning (Skinner, 1953).

Skinner's Experiments: Skinner kept a hungry pigeon in his box known as a 'Skinner box'. The pigeon has to raise his head to a particular height and peck at a particular spot in order to get his food which is automatically released on pecking. *The process of operant conditioning is the change in frequency with which the head is lifted to a given height.* The reinforcer is food and the reinforcement is the process of food presentation, when the response is emitted and when the head is raised to a particular height and a particular spot is pecked. The operant is the behaviour upon which the reinforcement is contingent, i.e., the height to which the head must be raised.

In operant conditioning, the important stimulus is the one immediately following the response, not the one preceding it. Any emitted response which leads to reinforcement is thereby strengthened.

The Law of Operant Conditioning

If the occurrence of an operant is following by presentation of a reinforcing stimulus, the strength (the probability to recur) increases.

The two Kinds of Reinforcers

Any stimulus whose presentation or removal increases the probability of a response is a reinforcer. There are two categories of reinforcers, the positive reinforcer and the negative reinforcer. Teacher's smile, reward, an affectionate pat at the back are positive reinforcers. Loud noise, punishment rebuke, anxiety, fatigue, etc. are negative reinforcers. The 'pleasant' or 'unpleasant' adjectives have not been used with reinforcers.

Punishment as Reinforcement: Punishment is a basically different process for reinforcement. Whereas reinforcement involves presentation of a positive reinforcer and removal of a negative one, punishment involves presentation of a negative reinforcer and withdrawal of a positive one. Experiments show that punishment does not permanently reduce a tendency to respond. Thorndike's experiments

with human subjects indicated that a reward strengthened the behaviour which preceded it, but that punishment did not weaken it necessarily. The reward stamps in the behaviour, but the punishment does not essentially stamp out. Punishment is positively harmful to both the donor and recipient. Its results are neither predictable nor dependable. Extinction—permitting a behaviour to die out by not reinforcing it—and not punishment is the appropriate process for breaking habits.

Types of Operant Reinforcements

There are two types of operant reinforcements—Stimulus discrimination and Response differentiation. Nearly all human learning can be classified under these two heads. However, the process of *respondent conditioning* (or, reflexive conditioning) should not be completely ignored. Through operant reinforcement, a relatively complex and new unit of behaviour may be learned, or, an existing (already learned) unit of behaviour may be refined. In general reinforcement which leads to behaviour acquirement is a process of discrimination of stimuli, whereas reinforcement (development of a skill) is a process of differentiation of response.

Process of Operant Extinction

In operant condition, an operant is strengthened through its reinforcement or weakened through its extinction. Extinction is the reverse of reinforcement. When a reinforcing stimulus no longer occurs following a response, the response becomes less and less frequent; this is operant extinction. Conditioning builds up a predisposition to respond—a reserve which extinction exhausts; operant extinction takes place much more slowly than does operant reinforcement. Extinction shows an interesting process of spontaneous recovery also. Sometimes an extinction curve is disturbed by some emotional effect. Failure of a response to be reinforced not only leads to operant extinction but also may be accompanied by frustration, rage etc.

EDUCATIONAL IMPLICATIONS

Skinner's view is one of the most important contributions to learning. It throws light on habit formation, habit-breaking and the role of incentives in learning etc. However, the most important outgrowth of this theory in educational practice is the concept of programmed learning and the introduction of teaching machines in educational technology.

Skinner mentions a few shortcomings of the current educational practices as :

(a) Behaviour of the students is dominated by aversion (escape) stimulation. They somehow want to run away from the dull and

dreary classes; (b) Too great a lapse of time exists between behaviour and its reinforcement. A boy who stands first in class in the month of April or emerges as the all-round best athlete even earlier in the month of January is rewarded in the month of December or even later in the ceremonial annual prize distribution of the school; (c) A skilful programme of reinforcement which moves through a series of progressive approximations to the final complex behaviour as desired is lacking. The efforts to lead students to educational aims are often not systematic and well thought-out. Hence slipshod guidance; and (d) Reinforcement of the desired behaviour occurs much too infrequently.

To overcome the above four main defects in our teaching a programmed instruction is recommended. Programmed instruction is a procedure for inculcating certain desired behaviour in a child.

Programmed Instruction

Programmed instruction helps in the psychology of learning to practical teaching problems. The second meaning refers to the application of engineering principles to the development of electro-mechanical equipment used for instructional purposes. The two aspects interact in the design and use of instructional equipment, materials and procedures. A measure of influence on the schools for the adoption of educational technology is business and industry.

Programmed instruction deals with the preparation, writing, try-out and revision of programmes. Programmed instruction includes reducing material to small steps, requiring frequent student response, providing immediate confirmation or correction and trying out and revising materials (Dececco, 1970).

In the preparation of programme there are five steps : selecting a unit or programme or topic, preparing a content outline, defining objectives in behavioural terms and constructing and administering tests of entering on terminal behaviour. In the programme writing there are also five steps: Presenting the material in the form of frames requiring active student responses, using prompts, to guide student responses, and providing careful sequencing of materials. A frame is a small segment of subject-matter which calls for particular student responses. There are four essential parts of a frame: the stimulus and stimulus context, the cues or prompts necessary to produce the response reliably, the responses the stimulus evokes: and the enrichment material which makes the frame more readable or interesting or which recalls previously learned materials to facilitate student response. All the basic learning conditions—discrimination, generalisation, contiguity, practice and reinforcement—can be embodied in the frame sequences. Frame sequence can also provide for review and testing whenever these are necessary. One of the major advantages for educational psychologists in studying

programmed instruction is the freedom allowed in manipulating the basic learning conditions.

There has been considerable research on the conditions under which overt responding is more facilitating than covert responding. Overt responding may be especially helpful when the learning materials are difficult; when they are easy, overt and covert responding may work equally well. There are also practical programme requirements which necessitate overt responding. Research points to two conclusions which have considerable significance: (1) Overt responses facilitate learning when the responses are relevant to the content of the lesson; and (2) overt responses should be required in the learning of unfamiliar and technical terms.

There are both formal and thematic prompts. The formal prompt provides the student with part of the responses. The thematic prompt depends on the student's previous association of a word or phrase since they derive from the denotations and connotations of the words which compose them. Four formal prompts are: partial response, rhyming, literal prompts, and frame structure prompts. Six thematic prompts are pictures, context-setting prompts, synonyms and antonyms, analogies, rules, and inductive prompts. The use of prompts require vanishing or fading. The use of prompts to guide student responses require to withdraw these prompts so that student can eventually emit the terminal behaviour without supporting cues.

In the tryout and revision of the programme there are three steps: writing the original draft, editing it and trying it out and revising it. There are three types of programmes: The linear programme provides a single path for all students to follow. In the branching programme, the student branches to supplementary material when he makes an error. Adjunct autoinstruction inserts programmed or testing materials into a Text book, laboratory manual or other materials whenever these supplementary materials are needed. In selecting commercial programmes the teacher should ask and answer four questions: Is it really programmed material? How does the programme fit the curriculum? How well will the programme teach in our situation? Can we afford it?

The second aspect of programmed instruction is instructional media. Instructional media are the electro-mechanical devices which act as a middle condition between the student and what he is to learn. The traditional media includes mockups, graphic materials, motion pictures, projected stills, and magnetic tape recordings. The new media include television, teaching machines and instructional kits. Three bases for the selection of media are described as: information about available media, an analysis and design of an instructional system, and knowledge of research findings on the use of media. In computer-assigned instruction there is sharp

distinction between hardware and software. CAI involves the use of typewriters, film projection, superimposed displays, cathode-ray tubes and random access slides.

The third aspect of programmed instruction pertains to flexible scheduling, in which the curriculum is conceived as an area to be scheduled. Modular units are the sub-parts of the schedule. The sub-parts of the schedule (or curriculum), the modular units, pertain to class size and length of period. Experts of programmed instruction have used the module of fifteen students meeting for thirty minutes. Course structure is the overall allocation of time and student, for a period of a week. A teaching team consists of a distinct student group, a small faculty group, and particular persons who assist the teachers and students. The characteristics of teaching teams can be described in terms of functions and personnel. Teaching team models can function within or across content areas and grade levels. The teaching staff comprises professional teachers and administrators, non-professional assistants and community consultants. A major advantage of team teaching is the opportunity for further training of novice teachers. Non-graded instruction allows assignment and advancement of the student on the basis of actual school achievement.

The adoption of educational innovations should be based on instructional objectives, student-entering behaviour and our knowledge of learning and instruction.

Laws of Learning

Thorndike¹² has laid down three Laws of Learning¹³; i.e., (i) Law of effect; (ii) Law of exercise or frequency; and (iii) Law of readiness. A brief description of these laws is given below:

(a) Law of Effect

The *modifiable relation between a stimulus and its response strengthens in satisfying and weakens in dissatisfying circumstances*. A modifiable relation means a relation changeable by learning. Some stimulus response relations are non-modifiable. Respiration, assimilation of food, snoring and pupillary reflexes illustrate such non-modifiable relations. In the example of the hungry cat in the closed puzzle-box with food placed at a distance in front of it, its learning to reach the goal depends on modified movements. The movements leading to the attainment of its goal give rise to the satisfactory situation of allaying its hunger. Therefore, the relations of these movements are strengthened or stamped in. The movements on the other hand, opposed to this goal, giving rise to the unsatisfactory situation of not allaying its hunger are weakened or stamped out.

12. Cf. Thorndike, E.L., *Human Learning and Fundamentals of Learning*.

13. Bhattacharya, op. cit., p. 111.

The Law of Effect is also called the Law of Reward and Punishment. Successful movements are rewarded with food or satisfaction of hunger, while unsuccessful movements are punished with dissatisfaction of hunger. The modifiable relations of the stimulus-response which bring in reward and punishment are respectively strengthened and weakened.

(b) Law of Exercise or Frequency

The Law of Exercise or Frequency has two aspects, viz., practice and want of practice. When modifiable relation between a stimulus and a response is established, its exercise makes it stronger and its want of exercise makes it weaker. Of course in both cases the first law must operate, viz., the relation exercised must be satisfactory and that not exercised must again be dissatisfactory. The law of exercise is closely related with the intensity and recency of relations. Repeatedly exercised reactions are modifiably related to bright light, loud sound and other intense stimuli. Again, the relation which has been established recently becomes stronger than that established in the past. The laws of exercise and effect act jointly. Generally what is satisfying or rewarding is alone exercised and what is dissatisfying or punishing is not exercised.

(c) The Law of Readiness

Thorndike means by the Law of Readiness the readiness of nervous processes. The neurones which are active on stimulation and conduct it in the form of nervous impulses to the central nervous system may be called conduction units. Not all conduction units are ready to carry their stimulation to the centre. It is satisfying for ready conduction units to carry their stimulation to the centre, while to do so is dissatisfying for conduction units which are not ready.

Some Other Laws: Besides the three primary laws, Thorndike states five secondary laws of learning: (i) The first is the Law of Multiple Response to the same External Situation. It consists in making varied movements in response to the same external stimulus, as the hungry cat confined in the puzzle-box does in relation to the presence of food outside and in front of it. Then there is (ii) its Law of Attitude, Set or Disposition. The hungry cat's attitude, set or disposition to seek food by making various movements leads it to learn to open the door of the closed puzzle-box. (iii) the Law of Partial Activity means that only a part of a certain situation may in some cases produce the whole reaction even in the absence of the whole situation capable of producing it. Learning, therefore, consists in being responsive to significant parts of a whole situation. The cat which has learnt its way out of many puzzle-boxes is more attentive to the small things in the new puzzle-box than a cat having

no experiences. (iv) The Law of Assimilation or Analogy means that the reaction caused by a situation may also be caused by one similar to it, though the latter could not elicit it naturally in the past. Past situations which produced no response come to acquire the capacity for producing the responses of situations similar to them. For example, the cat confined in a new puzzle-box and faced with a new situation repeats the movements made by it during its confinement in the old puzzle-box. (v) Lastly the Law of Associated Shifting is similar to the Law of Conditioned Reflex. A reaction can be elicited by an unnatural stimulus presented together with its natural one. The hungry cat, for example makes responsive movements at the sight of the pot itself in which fish was served in the past.

Problem Solving in Learning

According to Dewey¹⁴ learning is to think and, upon its intellectual side, education is the formation of careful and thorough habits of thinking. A major emphasis of progressive education is the insistence that pupils be asked to think, in other words that pupils be taught how to solve problems. In problem solving there are five phases of reflective thought. Reflective thought may be analysed in five phases, at the extremes of which we recognize a pre-reflective or beginning situation, in which there is perplexity of confusion, and a post-reflective situation—a feeling of mastery or satisfaction—when the doubts and confusions have been dispelled. In between states of thinking are, (1) suggestions of possible solutions; (2) an intellectualization of the difficulty of a problem to be solved; (3) the use of one suggestion after another as a leading idea or hypothesis to guide observation and the gathering of facts; (4) reasoning, in the narrow sense of the mental development of the ideas or assumptions, and (5) testing the hypothesis by overt activity. These five phases or functions of thought are not alleged to follow one another in any set order; there is usually considerable overlapping. The student should be familiar with the five steps in the complete act of thought, under the headings 'activity' 'problem' 'data hypothesis' and 'testing'.

Factors that Condition Learning or Principles of Guidance in Learning

Three factors¹⁵ condition learning, viz., (1) Motivational; (2) Physiological; (3) Environmental. The first refers to the activity of an organism in interaction with its environment. Activity or movement is brought about by motivating the learner. Motivation is the psychological factor in learning. The second is the physiological factor or the general tone of the organism. The third, i.e., the

14. Dewey, J. *How We Think*. Revised Edition, Heath, 1933, p. 301.

15. Pintner and others, *Educational Psychology*, Barnes and Noble, 5th ed, pp. 62-73.

environmental factor, represents the arrangement of the total environment which is most favourable to the learning process as a whole.

MOTIVATION: THE PSYCHOLOGICAL FACTOR

1. Aspects of Motivation

The terms, incentive, interest, drive and purpose stress various aspects of motivation. Motivation is the very heart of the learning process. Adequate motivation not only sets in motion the activity which results in learning, but also sustains and directs it. Reflection, interest, effort—all the outcomes most desired by the teacher and most valuable to the pupil—spring into being with adequate motivation. The average pupil works below his maximum capacity, his achievement quotient (AQ) is rarely 100, because of the lack of adequate incentives to learn.

Two kinds of motivation are commonly recognised: intrinsic and extrinsic.

2. Intrinsic Motivation

This most effective type of drive is secured by making the subject-matter significant or meaningful to the learner. Learning carries its own reward; there is interest in the activity, and pupil is bound to his work. The educational application is to begin at the point of contact, and within the range of the interest and capacity of the pupil. The project method (wholehearted purposeful activity), the occupational activities in a social medium characteristic of the New Education, the application concept in the Herbartian methodology are all attempts to create and utilise intrinsic motivation.

3. Extrinsic Motivation

Learning must often proceed in the absence of intrinsic motivation. Intellectual immaturity and lack of sensitivity to ultimate consequences and ideals may stand in the way of intrinsic appeal. Extrinsic motivation, however, is so called only because it is external to the learning activity itself, it is not in any sense artificial; must be built upon the foundation of some existing natural response or tendency; it must be intrinsic to the nature of the individual. Psychology has always recognised the existence of such drives or instincts as mastery or dominance, emulation or rivalry, desire for social approval, curiosity, construction etc. Psychologists disagree whether such tendencies are inherited or acquired or are partly the other. Instinctive drives are the chief sources of spontaneous attention and painless effort. They are enormous resources of potential energy at the disposal of learner and teacher, and they await only judicious employment and wise direction.

Some of the more common forms of extrinsic motivation may be summarised briefly as follows:

(a) *Praise and Blame.* These incentives are most effective when they come from persons held in esteem by the learner. Experimental evidence tends to show that praise stimulates average and inferior children, but has less effect on those of superior intelligence. Reproof is felt most by superior children, but girls seem more susceptible to praise than do boys. Some studies indicate, however, that regardless of age, sex, or initial ability, praise is the most effective of the incentives tested. Reproof seems to be less effective for all students. Among experiments on this factor, Chase in 1932 reported praise to be less effective than blame with young children, but Hurlock's studies in the 1920's led to the general conclusion, still accepted by contemporary investigators, that praise is the more effective stimulus in motivating both immediate and long-continued tasks.

(b) *Rivalry.* Rivalry between individuals is least desirable in that it may tend to breed resentment, jealousy and an excessively competitive spirit. Rivalry between groups is stimulating, but needs control. Self-rivalry, or rivalry in the form of competition with one's past record, is the most valuable type. Graphs of progress and objective standardized tests are of great instrumental value here. It is true, experimental researches have shown rivalry to be a powerful motivating influence. (Luba's experiments in the 1930's indicated an increase of 47 per cent in the achievement of school children with the introduction of the rivalry element. The work of the superior upper fourth of the group increased 34 per cent, that of the lowest fourth 71 per cent. Maller's studies showed group rivalry to be less effective than individual rivalry.) However, the emotional and social consequences of rivalry must be considered.

(c) *Rewards and Punishment.* There are more concrete expressions of praise and blame. They are, perhaps, the least desirable form of motivation. Punishment that is too severe, or inflicted when the reason for punishment is not clear and acknowledged, may breed resentment, antagonism, and desire to avoid the form of learning to which it is attached. Rewards in the form of money, exemptions and the like have been shown experimentally to be powerful incentives; but they are hardly ideal forms of motivation. On the intrinsic side, moreover, the joy of beholding a task well done is the best reward and incentive; while punishment by natural consequences of failure owing to lack of efforts carries its own moral.

Observations of child behaviour and experimental studies show that individuals tend to repeat forms of behaviour which have previously led to satisfying results. A sense of accomplishment may sometimes be induced by an artificial or even unjustified reward,

but it is far better grounded if based on the pupil's awareness of real success in learning. The rewarding nature of 'felt' progress helps to explain the stimulating effects of progress charts and similar evidence of educational achievement. There is a close relationship between rewards and the next form of extrinsic motivation, namely, knowledge of progress.

(d) *Knowledge of Progress.* Self-display (elation) and construction (feeling of creativeness) are the instincts operative here. Experimental evidence substantiates the common conviction that a concomitant realization of progress stimulates further effort. The use of graphs, curves of work and other records of progress is invaluable, especially for younger children. Opportunities for successful accomplishment should be provided. Too frequent failures dishearten pupils and develop a sense of frustration. Work should therefore, be definite in aim, within the capacity and interest of the pupil, but difficult enough to challenge effort in the accomplishment.

Experiments by Judd in 1905 were among the first to demonstrate that practice without awareness of results had no effect on certain types of learning. For example, Judd found that such practice did not improve the learner's judgments concerning the lengths of lines. Correction of errors supplemented by knowledge of progress did improve the learner's judgments. Thorndike's experiments (reported in 1935) showed similar results in the case of both mental and motor behaviour. His experiments with nonsensical words seemed to indicate that imperfect learning, under conditions of self-direction, is risky in that it may strengthen incorrect responses. The experimental studies of C.L. Stacey with meaningful material in 1945 led to the contrary conclusion, however, that allowing the learner to discover facts for himself, noting his own errors and progress, is more effective than requiring him to accept ready-made decisions and explanations. More experimentation is needed in order to clarify the complicated processes whereby knowledge of progress influences growth attainment.

(e) *Other Sources of Motivation.* These include desire for social approval, the urges to mastery or dominance, the urges to excel, to overcome opposition, to acquire, the sex and parental impulses, etc. To repress ruthlessly such urges is to try to denature the individual; but to allow free and unrestrained outlet is equally disastrous. Natural impulses in themselves are neither good nor bad, they become so to the extent that they are directed into desirable or undesirable channels of action. Management may take the form of redirection or sublimation. It is the part of wisdom to provide outlets that are not merely escape valves, but positive opportunities for achievement. Pictorial art, sculpture, music, literature, etc.,

are largely expressions of instinctive drives coloured with an emotional tone and given intelligent direction.

4. The Psychological Basis of Motivation

The psychological factor in all its varied forms is based ultimately on a sense of well-being and satisfaction. This satisfaction results from or accompanies anticipation of successful accomplishment of a task that is attractive in itself, a duty well done (with its consequent relief from tension), or negatively, the avoidance of painful or undesirable consequences. Such experiences tend to impress themselves, and so tend to be remembered and learned. The popular maxim, "nothing succeeds like success" is true and the principle involved is more ambitiously formulated in the law of effect.

5. The New Education and Motivation

The forms of motivation we have described are not all acceptable to progressive education. A fundamental thesis of the progressive school is that education should take place in and through the life situation, that is through occupational activities true to life and carried out in that spirit of cooperation and responsibility necessary for human beings banded together in a community. Traditional education emphasised the competitive and acquisitive motives in consonance with a social order that revered individualism and regarded accumulation of wealth as a criterion of successful living. Progressive education stresses cooperation and sharing in consonance with its ideal of democracy, a sharing of interests within and among the various groups which constitute the larger society of mankind. Exaggerated competition is no longer to be encouraged. Yet, marks, grades, scholarship contests, honour-rolls and the like are still too often considered reputable incentives in an effort to stimulate intellectual endeavour; the dominating influences of the social order from which we are trying to emerge are thus perpetuated, and the school becomes a stumbling block in the path of progress. It is the claim of the proponents of the new education that not only are external or individualistic incentives undesirable as forms of motivation, but they are also unnecessary. Many progressive schools have successfully subordinated them to social values

THE PHYSIOLOGICAL FACTOR IN LEARNING

1. The Organism and Perception

Throughout the organism, internal to it as well as on the surface, there is a complex organization of sensory receptors, which receive and record, in some undefined fashion, the impressions made by internal and external stimulation. To the five important senses recognized by tradition, modern science has added the kinaesthetic posture, pressure, and pain and other senses, these being

largely refinements of the sense of touch. Whatever the number, the aptness of Milton's poetic reference to sight, hearing, taste, smell, and touch, as the five gateways of knowledge remains. All knowledge is based on sense perception. The loss of or defects in any sense means that knowledge and learning are impoverished in proportion to the loss. Perception means etymologically, 'to grasp thoroughly'. To grasp thoroughly (on the perceptual level) signifies to react in all possible ways, by sight, touch, etc. This fact is well-expressed in the pedagogical dictum, multiple sense appeal. Perception is not merely the visual, auditory or other image of an object present to the senses; it involves cognition or the consciousness of a number of facts associated with the object perceived. These facts are derived from experience with the object or with related objects. In this sense it may be said that every act of perception involves apperception. It is important, therefore, to examine the organic factors which condition perception, for perception is the foundation of all higher forms of knowledge.

Learning is dependent on (1) the relative perfection of the senses and (2) the general tone or condition of the organism. Important factors which condition the organism are age and maturation, temperature, time of day, drugs, and whatever causes strain of fatigue.

2. Organic Defects

In the process of learning, particularly in the school, the distance receptors (vision and hearing) are at once the most obvious and the most important instrumental factors.

(a) *Visual Defects*

Visual defects in the schools range from 20 per cent in grade 2 to over 30 per cent in secondary schools.

Hyperopia or hypermetropia (far-sightedness, too short an eyeball).

Astigmatism (blurred vision due to irregularity in curvature of lens, causing conflicting foci).

Myopia (near-sightedness, too long an eyeball).

Strabismus (cross-eyedness, caused by lack of control over the six pairs of eye muscles).

Colour-blindness. Red or green colour blindness is found in some degree in three or four per cent of men. It is rare in women (less than one per cent). It is now acknowledged that there are many kinds and degrees of colour blindness in addition to the total and partial varieties. There are, moreover, age and sex differences in colour preferences.

Defects of vision may easily pass unobserved for long periods. Most of them cause headaches, nausea, and a general disinclination to study, often attributed to laziness. The importance of properly printed textbooks, lighting, posture relative to light (from the left in the case of right-handed pupils) is now generally recognised.

(b) *Auditory Defects*

Estimates of the prevalence of auditory defects range from 3 per cent who are seriously deaf to 10 to 20 per cent who do not possess entirely normal hearing. Since music is now a required subject in many school systems, the differences among individuals as to pitch discrimination emotional reaction to music, musical intellect, etc., have become a matter of some importance for educators.

(c) *Focal Infections*

These occur in the tonsils, ears, appendix, teeth, sinuses etc., and cause irritability, nervousness, headaches and other disturbances.

(d) *Adenoids*

Adenoids (growth in the nasopharynx) causes mouth breathing and lowers vitality. The glands, especially the pituitary and thyroid, function abnormally and cause irregularity of reaction, particularly during childhood and adolescence.

Experimental inquiry offers no clear evidence that the above defects and such diseases as hookworm affect the I.Q.; but they do offer serious obstacles to the learning process, and improvement always results on their removal.

3. Fatigue

(a) *Types*

Muscular, sensory and mental fatigue are generally differentiated from each other. Muscular and sensory are conveniently designated as bodily (muscle) fatigue; mental or neural fatigue is generally referred to the central nervous system. Physiological fatigue is attributable to the presence of toxic waste products resulting from activity, to the lack of oxygen, and other causes. The chief effect on the learning process is the accompanying disposition against sustained intellectual activity.

(b) *Mental Fatigue: Boredom*

Experimental evidence shows that mental fatigue is extremely difficult to produce. Prolonged mental work may be engaged in with little loss of efficiency provided adequate stimulation be present. What is called mental fatigue is attributable to boredom and the latter to lack of interest in the subject, poor teaching methods, etc. The remedy is change of method or change of subject, particularly in the case of young children. So called nervous or mental breakdowns are attributed to worry, malnutrition, or some organic deficiency, and rarely to excessive mental work. Eye strain, bad posture and atmospheric conditions are important contributing factors to what is called mental fatigue.

4. Time of Day and Learning

Experimental studies by Winch, Gates, Heck and many others indicate that there is little variation in efficiency throughout the school day. Lessened interest, boredom, restlessness and poor ventilation (according to Heck) account for any decrease in capacity. Improved teaching methods may, therefore, prove to be the remedy. Studies of progress of evening school pupils show losses of efficiency varying from 1 to 6 per cent only. Undue stimulation may, however, account for these results, so that normally such stimulation and greater effort must be used to secure results comparable to work done during the early part of the day.

5. Atmospheric and other Conditions

The optimum atmospheric conditions are 68 F, 50 per cent, rel. hum, 45 cu. ft. outside air per person per min. According to experimental evidence, a hot stagnant air condition, noise, etc., need not retard the learning process, provided adequate stimulation be present. The experiments, however, covered comparatively short periods of time and showed merely that when work is undertaken with a will, physical discomforts can be overcome. Normally such discomforts are distracting and do not favour the proper mental set-up or disposition to learn.

6. Drugs: Alcohol, Caffeine, Tobacco

The experimental evidence with regard to drugs is inconclusive and conflicting. Temporary stimulation in the case of those addicted to such drugs may help tide over a brief period of intense effort, but, in general, prolonged indulgence is in the long run, unfavourable to the learning process.

7. Sex Differences in Fatigue

There is some evidence that, during the secondary school years

in particular, girls are more susceptible to strain and worry than the majority of boys. School work should be adjusted accordingly. Boys not only have greater resistance physiologically, but being less conscientious, as a rule, acquire a degree of immunity to fatigue by giving up work that requires too much scholastic effort.

8. The Effect of Age on Learning

(a) *Popular Opinion*

Popular opinion concerning this important problem has found concrete expression in the maxim, 'you can't teach an old dog new tricks.' People may have always realized that this maxim is only a half truth; but the conviction remains that at forty years of age or so, the acquisition of a new language or trade, the mastery of the piano or typewriter and the undertaking of any new venture require exceptional effort and application, and the results never equal the expenditure of similar energy in youth. How far is this assumption true? The following factors must be taken into account: (1) the age of maximum mental growth (the age at which M.A. reaches its limit), (2) the interests, motivation, apperceptive background, etc. present at the ages compared; (3) the elasticity and general responsiveness of the nervous system.

(b) *Age and Mental Maturity*

As a result of experimental investigations, psychologists no longer believe that mental growth ceases at sixteen or eighteen years. Capacity to learn continues to improve, though at a diminishing rate, until at least twenty-three years of age. There seems to be a plateau until close to forty years. Thereafter, a decline ranging from one-half to 1 per cent each year reduces the learning capacity to what it was in the middle teens, that is by about 15 per cent of the maximum.

(c) *Theoretical Considerations*

Apart from experimental evidence, theoretical considerations prompt the following conclusions:

- (1) Activity, fundamental to all learning has greater directness and control at the later age-period: there is less waste of energy.
- (2) Attention, interest and motivation are more likely to be present at middle age when there is the will to learn.
- (3) Perceptual learning is distinctly in favour of the mature person because a richer apperceptive background of experience is brought to bear on the learning.

(4) Problem solving is easier for the same reason, as is also the memorized learning of organized material.

(5) In the case of nonsense or unorganized material, the difficulty of motivation and lack of receptivity for such material may militate against the mature person; but more efficient methods of study will largely compensate for these factors.

(6) In sensory-motor or skill subjects, to begin in youth makes for greater permanence and excellence, particularly in the case of languages. It is probably that a greater amount of practice accounts in large measure for this difference.

ENVIRONMENTAL FACTOR

In the environmental factor we include the environment which prevails in the school, home and locality. The family environment is bad, if it adversely affects the learning process. Similarly, the school is another factor in environment. The school nurtures many values and attitudes of society. It has to direct social processes and plays an important role in personality development. Thirdly, locality, has an important place in the environment. If the locality is bad, the learning will to some extent be ineffective.

Methods of Learning

The method in learning involves the question of how to study. The following are methods of study based on experimental investigation.

(a) *Whole to Part Method*

This means that the general nature of the material should be apprehended first, at the level of the learner's insight. This method is in accordance with the Gestalt principle that learning proceeds from the whole to its parts and not vice-versa.

(b) *Whole vs. Part Method*

A poem of reasonable length, to be memorized, should be learnt as a whole rather than by parts. What a reasonable length is, depends on the possibility of securing a central idea or unit of thought which may act as a focal or reference point for related material. Where the material is too long the mediating method (below) should be used. The part method has proved most fruitful in nonverbal material, such as skills, typewriting, etc., and meaningless material such as nonsensical syllables. The whole method is not valid here because there is no logical unity or continuity in the material. Yet the whole method is operative to the extent that spatial position and order assume a coherence or whole which enables the learner to retain the material.

(c) The Mediating Method

The whole method, strictly interpreted, proves cumbersome and even wasteful in material of great length and varying difficulty. If all the materials receive the same time, the middle and more difficult portions of a long speech or poem are not so well-learned as the beginning to end. Such disadvantages are remediable by the mediating method. This method, applicable to long vocabulary material, as well as to more logical wholes proceeds from whole to part as before, but allows the marking off of more difficult or unfamiliar parts for more intensive study. The whole method is still being applied and the learner must never lose sight of the relation of the parts to the whole, nor concentrate on the former to the exclusion of the latter.

(d) The Recitation Method

When time allows, this method is always of value for all kinds of material. It simply means checking up on one's self by being one's own inquisitor, from time to time. The outstanding advantages are (a) weak connections are discerned and made the object of concentrated attention; (b) a general feeling of accomplishment which stimulates further effort; (c) errors due to wrong first impressions are soon detected and eliminated before they become established; and (d) since the material is learned as it is to be used, little transfer is necessary in the later reproduction. Experimental evidence indicates that about three-fifths of the period of study may, with profit, be devoted to recitation. It has also been found that the recitation method of study is better for (a) both immediate and delayed recall, and (b) both sense and nonsense material.

(e) Length of Practical Periods

The maximum period of productive study, as found by experimentation on memorization, typewriting, arithmetical operations, and archery, is 20 to 30 minutes. Periods of more than 30 minutes of concentrated study are relatively unproductive. It is probably that such a recommendation cannot be made for history and subjects that may demand an initial warming-up process. Interest in a subject, likewise, may extend the limit beyond which the law of diminishing returns would begin to operate.

(f) Distribution of Practice Periods

Distribute the time at your disposal. The experimental evidence is entirely against continuous study over a long period. Suppose 120 minutes are available for study. Ten minutes a day, for six days give better results than 22 minutes once a day for six days; this latter method is in turn far more productive than one 120 minute period. In the case of delayed recall of meaningful material, the distributed study method gives relatively greater return.

(g) *To Counteract Forgetting, Overlearn*

The Ebbinghaus and Radossawljewitsch studies on the retention of material or the rate of forgetting, show that after learning material (nonsense syllables) to the point of one (Ebbinghaus) or two (Radossawljewitsch) correct reproductions, forgetting sets in immediately and is most rapid in early stages. To counteract this factor, reviews should begin on the next day at the latest (especially for the very young) and take place at comparatively frequent intervals. The periods between practice may be gradually lengthened and continued until over-learning is assured. Over-learning, in general, is necessary for delayed recall.

(h) *Cramming*

This is the attempt to acquire control, usually for the purpose of immediate reproduction, of a relatively large amount of material in a comparatively short time. Cramming, therefore, may not be confined to a few days or weeks before an examination; it may cover weeks or months of study. A Summer School course of six weeks may be tantamount to a cramming process in the case of certain subjects. Certain types of examinations and certain life situations may justify cramming; but where real permanence is desired cramming is of little value. Learning is a product of maturation, of enlargement, of meaning and apperceptive mass, of assimilation. For such an outcome time is necessary.

(i) *Speed of Learning in Relation to Retention*

There is a popular saying that¹ 'quick learning means quick forgetting', meaning thereby that there is a negative correlation between quickness of acquiring a habit and its retention. The experimental evidence is not conclusive enough to reject the generalization altogether. With meaningless material the popular view is correct: those who learn quickest forget quickest. With all other material those who learn quickest forget the least. Again, those who learn quickest make more use of the whole method than the slower individuals, and retain the best when the material is logical in character.

LEARNING CURVES

Learning curves register a sharp rise at the start. Then the rate of progress in learning slows down and reaches a limit beyond which further improvement seems impossible. This 'impossible' is the plateau of learning. (See Fig. 3)

In learning, curve improvement gradually diminishes in relation to time as follows:

Time in Minutes	Achievement
1	1
2	2
4	3
8	4
16	5

This deadlock in learning is caused by lack of interest, bodily fatigue, loss of initiative and inattention. The other causes may be the physiological limit of the learner as determined by his age, brain power and the methods followed in learning.

Plateaus in Learning

Plateaus have been explained as due to: (1) a more difficult stage in the learning process; (2) loss of interest or boredom; and

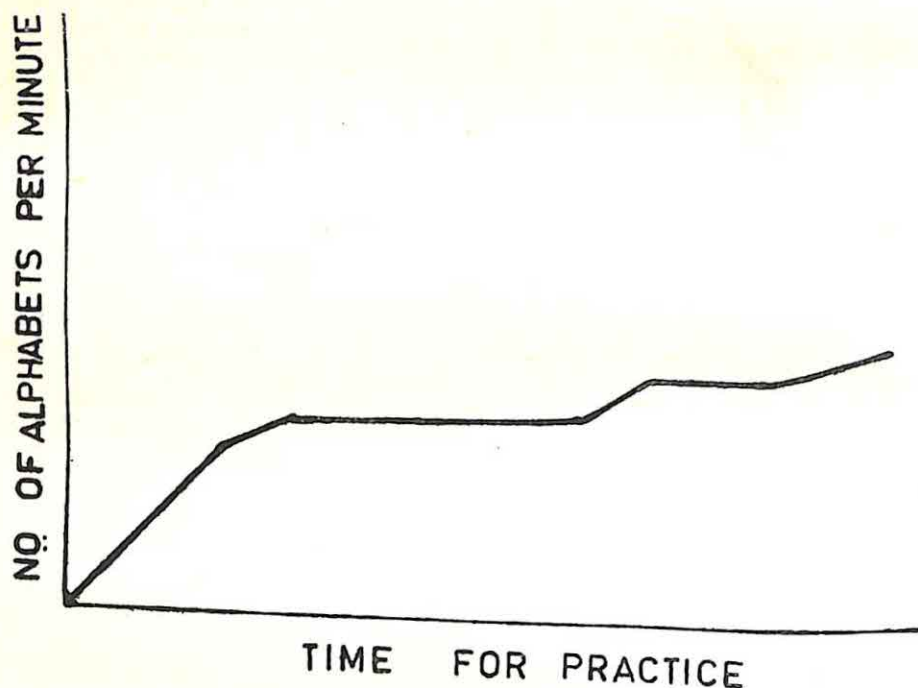


FIGURE 3

The Curve of the Rate of Learning

(3) reaching of higher stages in the hierarchy of habits of which all learning, according to Brayn and Harter, is composed. In telegraphy the basic habit is the 'letter habit.' Upon the letter habit the word 'habit' is built; and following and depending upon the latter is the

'phrase habit.' A plateau appears when a higher stage in the hierarchy is being attempted before the necessary lower stage is perfected. Experimental evidence does not support the conclusion that plateaus are inevitable in all forms of learning though many psychologists accept the theory of the hierarchical nature of all habits and are inclined to believe that all three causes of plateaus are operative. A Gestalt explanation attributes plateaus to failure to construct a satisfactory configuration through requisite mental process and muscle activities.

The Psychological Limit in Learning

Learning curves have drawn attention to the fact that the capacity of the individual in any phase of learning is limited by the potentiality of his organism. The speed of performance in any subject, such as typewriting, depends upon the neuro-muscular mechanism and the general control of the responses. In knowledge subjects, too, one is limited by one's inborn capacity which is supposed for the average individual, to reach the maximum between fifteen and twentyfive years of age. This latter limitation applies primarily to the ability to perceive relations, and not to the amount of knowledge one acquires, though there is obviously a relation between the two.

The concept of psychological limitation is of immediate interest only in connection with the skill subjects. Few persons reach this limit, though it is probably that many approach it more closely in skill than in knowledge subjects. The ratio of actual to theoretical psychological limit is for each person a measure of his achievement (A.Q.).

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TRANSFER OF LEARNING

CONSIDERABLE significance has been attached in educational psychology on the problem of transfer of learning. In the past, one of the important academic questions that was discussed widely by educational psychologists was to ascertain as to how previous learning affects subsequent learning? For the past many years, educationists and psychologists have debated on this question and lot of scientific work has emerged out of investigations on transfer of learning. The interest in the subject was aroused by William James. He had found, in 1890, that practice in memorizing Miltons *Paradise Lost* did not produce any improvement in memorization of French poetry. This finding had evoked a lot of research in the field of psychology and education. The necessity for this research was aroused by the importance of the subject in the field of educational psychology. It is a fact that 'almost all educational and training programmes are built upon the basic perview that human beings have the ability to transfer what they have learned in one situation to another'. This relationship is important for any educational practice as it gives importance and faith to the practicality of formal education. Further, teachers generally want their students to be able to make use of the experiences that they have gained in the class-room in meeting situations in a variety of life situations. Any teaching and educational programme would aim to function as widely as possible in the daily life of a person. Learning can become functional only when it is able to make a student feel confident to use his experiences and skills, obtained in one situation, in another situation which is somewhat different or slightly modified in its form. Ways and means to make education more functional and positive is the positive goal of any education in any country which cares to look after its development.

Problem of transfer of learning is important from another angle also. There are lot of people who believe in the theory of 'Formal Discipline.' This theory purports that education and training can infuse discipline in a student and this quality of mental and personal discipline can influence the conduct in future events in one's

life. This way of thinking had influenced many educational practices and many educational programmes were made and reshaped on the basis of the spirit of this philosophy. Educationists and psychologists wanted to control educational practices on the presumption that accuracy and application of skills, given to an individual, will influence his application and merit in other important situations of life.

William James results on transfer of learning aroused a rush of concern as to whether in fact transfer was present in the school curriculum and what were the exact conditions under which transfer could occur. The concept of transfer itself became an important issue as it was realized that all learning involves transfer through time.

The importance of the topic of transfer of learning in educational psychology has become also important as it has become related to a variety of allied concepts such as: cross-education, generalization, learning sets, discrimination reversals verbal mediation, transposition, psychoanalytic transference and displacement, retroactive inhibition or facilitation, and many others." It is evident from this that transfer of learning has broad implications. The extent to which tasks, characterised by motor skills or *dexterity* and tasks characterised by perception of patterns of relations within complicated stimuli, are primary issues of transfer and the extent to which they can be influenced by the application of logical analysis is a point which has been scientifically analysed by researches on the subject.

Basically, transfer of training or learning deals with the important question of whether or not the learning that takes place in one area helps learning in another situation. It investigates whether learning in the field of mathematics can help or hinder future learning in another subject say physics or chemistry. It also wants to investigate factors under which learning in one situation can positively help in learning in another subject. It also addresses to the problem as to how a human being can profit to the greatest degree from its experience in one situation when he finds himself in another situation or series of situations. Educationally, this is an important problem which every school has to take note of. It is the obligation of a school to ensure that students are able to learn to transfer their experience to as many situations as is practical. Such a school alone can promote the practical and functional utility of studies in a society.

Importance of the problem of transfer of learning becomes, thus, evident from the following educational requirements which no school can ignore.

1. It is necessary to investigate the influence of the

- improvement in one mental function upon the efficiency of other functions.
2. What is the extent of reciprocal improvement in learning?
 3. What is the degree of animation in a learning situation?
 4. Is transfer of training possible in reasoning?
 5. Is transfer of training in learning possible in a submerged target?
 6. What is the degree to which values can be transferred from one situation to another?
 7. What are the types of abilities that can be trained for transfer?

The aforesaid questions have been examined by educationists and psychologists from time to time. Impetus for research on transfer problems have been received particularly from psychologists like Thorndike and Woodworth. Mursell has also surveyed the problem from various angles with a view to determine its importance. Without such investigation, educational processes cannot retain its disciplinary spirit and instruction and would, thus, cease to be an art. Education will lose its practicability and its role as character-building process will vanish.

SCIENTIFIC ATTEMPTS TO PROBE INTO THE PROBLEM ON TRANSFER OF LEARNING

In order to study the problem of transfer of learning, many investigations have been carried out during the last 50 years. These investigations have adopted various experimental designs for studying the problem under scientific and control conditions. These experiments have studied the problem of transfer from various angles, the quantum of transfer that could be possible under given conditions; the impact of transfer on educational system, to examine the value in the discipline theory of education, etc. The spirit behind these experiments was to study the potentialities of educational theory regarding the extent to which special forms of training could improve the general capacities of the mind. Types of experimental designs used in transfer problems have been different. Various designs, as explained by James Deese, are briefly mentioned below:

Deese reports that "there are two basic types of designs for transfer studies. One of these evaluates the effect of a prior task on the acquisition of a second task, and the other evaluates the effect of an interpolated task upon further practices or retention of initial task. The second type of design is particularly appropriate to the study of forgetting." He describes one design as practice, which is simple and requires two groups of subjects—experimental and control. One group practices a task under certain conditions and after

this practice they are tested on acquisition of a second task. The other group of subject is allowed to practise the second task. The performance of two groups of subjects is compared and the differences are tested statistically. If the first group of subjects, who had initial practice, scores better than the second group, who had no practice, positive transfer is said to have taken place.

The other design of experiment is called as "the retroactive design" by Deese. He describes the design in the following manner :

Experimental Group

Practices task A...Practices task...B...Test on task A.
Practices task A...Rests...Tested on task A.

The differences between the performances in two subjects are calculated. Any difference in the performances of two groups of subjects is caused due to the influence of practice on task B. This design has been also called the fore-and-after method.

The types of controls that can be used in the experiment are varied and manifold. It depends on the purpose of the experiment. Types of controls in an experimental design called retroactive design can be different from one on proactive design. Types of controls used in human situation may be different from one used in animal situation. There can be lot of variations in use or controls in an experimental design.

Another significant experiment on transfer of learning was conducted by William James. He had reported the findings of his experiment in his book entitled *Principles of Psychology*. His experiment, as described by Skinner, was as follows:

He (William James) memorized 158 lines from victor Hugo's Satyr. He then trained his memory by practising 20 minutes a day for 38 days in learning the first book of Milton's *Paradise Lost*. After this memorization exercise was over, he again tested his ability to memorize 158 lines of the Satyr. William James found that it took him more time to memorize the second 158 lines than it did the first.

The experiment was again performed on four subjects under similar conditions as that of William James. The results from those four subjects were similar to those of results obtained by William James. This experiment was followed by a series of other experiments on the subject and it is reported that since 1890 some 300 studies have been performed in this subject. These studies have made analytic and depth studies on transfer and the main aim was to establish the influence of one task upon the performance of another. These experiments on transfer gave rise to lot of learning

curves. Types of materials used in transfer experiment are many. They can be classified broadly into the following types :

1. Sensorimotor materials.
2. Perceptual materials.
3. Memory materials.
4. Reasoning materials.
5. Ideals, and
6. School subjects.

It may not be possible to give details of the experiments of all experiments. However, results of some of the prominent experiments are given below :

Thorndike tried to study the influence of improvement in one mental function upon the efficiency of other functions. He tried to study the problem as how far does the training of any mental function improve other mental functions? On the basis of his experiments, he came to the following conclusions :

"The notions of mental machinery which, being improved for one sort of data, held the improvement equally for all sorts; of magic powers which, being trained by exercise of one sort to a high efficiency, held that efficiency whatever they might be exercised upon; and of the mind as a reservoir for potential energy which could be filed by any one activity and drawn on for any other—have now disappeared from expert writing on psychology." This is a rich evidence on the limits of formal discipline.

Peter Sandiford also carried a series of experiments on problem of transfer. He has summarised the experimental findings in the following manner :

1. The transfer effect of training may be negative, zero or positive. It is usually positive, but the amounts are usually much nearer to zero than to 100 per cent.
2. If the transfer effect is considerable, it is invariably found that the contents (or methods of presentation) of the testing and training materials have many elements in common.
3. There is little ground for the belief that the intellect secures an all round training from the specific training of any part of it.

K.S. Yum tried to study the problem of transfer by examining the issues in the law of assimilation. The study wanted to find out the extent to which a motor response that has been contiguously associated with a given perceptual stimulus be aroused by a similar stimulus with which it has not been associated. On the basis of

the results from his experiments, he comes to the following conclusions :

1. Our experiment has established the fact that a naming response that is contiguously associated with a visual stimuli is likely to be aroused by a visual structure with which it has not been so associated whenever the two stimuli exhibit certain kinds and degrees of similarity.
2. The effectiveness of three kinds of similarity has been demonstrated—similarity of nonsense syllables in respect to meaning, and similarity of visual patterns. There are no data on the relative effectiveness of these three kinds of similarity.
3. With similarities of meaning and visual patterns, the likelihood of recall varied directly with the degree of similarity. There was no evidence that the likelihood of recall varies with the amount of similarity of nonsense syllables as measured by the number of letters in common.
4. With nonsense syllables employed as stimuli, the likelihood of recall varied with the locus of the common letters.
5. Presumably this phenomenon can be obtained with other modes of stimulation, auditory, e.g., with other than naming responses, with other kinds of similarity, and with wider degrees of dissimilarity than those employed.

Yum has thus come to a wide series of conclusions regarding transfer of learning.

Many experiments were directed to study the problem of transfer of training in reasoning. One of the prominent studies was made by Barlow of University of Utah. By transfer he meant the learning influence of one training activity on a different activity. His experiments were utilised in training such mental functions like abstracting, analyzing and generalizing. He came to the conclusion that transfer seemed to depend on the analysis of the mental steps involved in learning, on description of various aspects of the problem under consideration, on comparisons in regard to similar problem; methods and practices in definitions; one proceeding from the concrete to the general and vice-versa with respect to reasoning in training material and on internal efforts to apply learning methods.

Some psychologists are of the view that general transfer takes place in the form of the learning curve. Transfer as a result of similarities between test material and the training material is to be accounted in terms of increasing complexity of the learning activities. Barlow has found that transfer takes place in the degree to which activities learned during practice become organised

components of the end test responses, implies learning to be a unitary experience which grows more complex with practice.

Gordon Hendrickson and William H. Schroelder had changed the design in the experiment on transfer in the sense that they used a target which was submerged. They had taken the study to confirm the findings of Judd and Scholekow. The authors had finalised experimental and controlled groups of subjects. The results obtained by them on transfer were as follows :

1. Knowledge or theory facilitates transfer.
2. Theoretical information aid not only in transfer from one situation to another, but also in making the original adjustment to the first situation.
3. The definiteness or completeness of the theoretical information had a direct effect upon both initial learning and transfer.
4. The importance of individual discovery of the solution of the emergence of a sudden insight, in Gestalt terms is apparent.
5. Success in the type of problem presented is probably conditioned by other factors in addition to knowledge of a theoretical principle as formulated by a teacher.

J.M. Stephens has also undertaken a lot of experimental work in transfer of learning. He wanted to study the nature and characteristics of transfer from a broad and educational angle. He concluded that a number of phenomena, which suggest some basic processes in transfer, were responsible for transfer. His important findings were as follows :

1. Marked positive transfer is usually found when there is a mere shift from one sense organ to another.
2. In motor learning, bilateral transfer or cross education has been frequently observed.
3. Marked positive transfer occurs whenever the learner works on a series of complex but similar problems.
4. The results of transfer are likely to appear at any time after the experience in the training task. The amount of transfer seems to be affected little, if at all by the interval between practice in the training task and the test on the criterion task.
5. Transfer is clearly affected by the similarity in the task being performed. There is more transfer when the training task and the criterion task resemble each other in their over-all characteristics.

6. Transfer is more likely to occur in extroverted than introverted students and in younger than in older students.
7. Intelligence has long been assumed to be an important factor in transfer. Intelligent students may be more successful in perceiving and formulating the general principles.

Gross, another experimental psychologist, attacked the problem of transfer from another angle. He wanted to study transfer to a motor task as influenced by conditions and degree of prior discrimination training. His results from the experiment were helping in throwing further light on the problem of transfer. His experiment was concerned with transfer to a discriminative motor task as a function of degree of experience with different conditions of prior discrimination training with stimuli of the manipulative task. He concluded that :

1. All types of activation or acquisitions of discriminative verbal responses, with exception of the seeing experience, resulted in some positive transfer.
2. There were no differences among the three types of verbal learning experience which, for higher degrees of mastery, were superior to the three types of experiences which involved seeing discriminating.
3. Amount of positive transfer increased with mastery of verbal responses but did not vary with amount of any of the seeing and discriminating experiences.
4. The over-all pattern of the results was considered consistent with the hypothesis that dissimilar verbal response produced stimuli increased the distinctiveness of intensities.

Many experiments on transfer were done with a view to study whether values could be transferred from one situation to another. One of such experiments was performed by G.M. Haslerud and Shirley Meyers at the University of New Hampshire. The educationally important question of how much guidance is desirable if one is interested in transfer was attempted by these two authors. They concluded that :

1. Independently derived principles are more transferable than those where the principle is given to the student.
2. Fast and accurate learning or performance under immediate guidance is no guarantee of transfer to new problems without such support.
3. Adults on letter-symbol substitution rapidly attain a plateau on transfer problems because of 'learning sets' from early childhood.

Morrisett and Hovland have tackled the problem of transfer from another way. They tried to study and compare three varieties of training in human problem solving. Their aim was to compare the efficiency of single-problem training and multiple-problem training in producing transfer to a new problem. From his experiments, they came to the conclusion that :

1. Continued practice is essential to produce adequate original learning.
2. New habits seem to set up within each problem.
3. Transfer is conceptualized as a process of learning of a single class of habits to a complex set of cues.
4. Successful transfer would involve learning responses to the complex pattern of stimuli produced both by the immediate environment stimuli, e.g. the pattern of the slide, and traces from prior stimuli.
5. Traces of prior stimuli as well as immediate environmental stimuli determining the response.

Relationship between problem solving behaviour and transfer were studied by Schulz in his experiments at the State University of Iowa. He has come to very interesting relationship between the two. The conclusions arrived at by him are :

1. Reinforcement is an important variable in transfer situations.
2. On T-maze or finger-maze, it is revealed that intermittent reinforcement does lead to an increase in the amount of negative transfer in performance of another task. In most 'real life' learning and problem solving behaviour is most likely to be accompanied by intermittent rather than continuous reinforcement, the question of reinforcement cannot be overlooked.

From the above quoted scientific studies it is apparent that transfer question is not a simple psychological affair. It involves various problems and various variables. Most of the findings from various studies do not contradict each other but only support each other with minor degree of variation. The findings are important from the educational point of view.

THEORIES OF TRANSFER OF TRAINING

From the results on transfer of learning, various theories have been advocated on mechanism of transfer. Three theories are important. They are :

1. Theory of Identical Elements.
2. Theory of Generalization.
3. Theory of Similar Elements.

Theory of Identical Elements

Thorndike and Woodworth were the main persons who advanced this theory. On the basis of experiments carried out in 1901, the two authors concluded that transfer occurs from one situation to another because of the presence of identical elements. It is the presence of identical elements that influence one situation from another. They influence functions from situation to situation of similar types. They described these identical elements as identities of substance (matter) and identities of procedure (method). It is argued that anthropology will help psychology because both deal with process of man's development. Addition is supposed to improve multiplication because lots of additive processes are required in multiplication tables. One language helps the other as method of study used in two languages have the common elements of vocabulary.

Thorndike maintained that one mental function alters any other function only in so far as the two functions have identical elements as factors. He suggested that there were some neural bonds in the two situations as the cause of transfer. Others have given their explanation in terms of identity of content, identity of procedure, and identity of aims or ideals.

Bagley had proposed that transfer was possible under identical elements through perception of ideal or an aim. He felt that the ideal of work could be transferable from one situation to another.

Peter Sandiford states that "this theory of identical elements is a perfectly reasonable one. Out of the millions of specific reactions, each with its specific connection in the nervous system, some of them are bound to be common to several situations. The greater the number of these common elements, the greater will be the transfer effect."

It is, thus, evident that a large part, if not most, of which children learn in schools will be useful to them in the great variety of conditions they face outside the school room.

2. Theory of Generalization

Judd, a psychologist, is the author of this theory. On the basis of work that he conducted on transfer of learning he came to the conclusion that transfer takes place to the extent to which a learner is able to generalize his experience.

Judd would maintain that trained intelligence is particular in its

content but general in its method. It is, he asserted, the characteristic of human thinking that wherever one encounters any phenomenon one tends to interpret it in terms of general categories. He felt that the type of training which students receive is determined by the method of presentation which and by the degree to which self-activity is induced rather than by content. He felt that it would be wrong to state that any subject taught with a view to training pupils in methods of generalization is rightly useful as a source of mental training, and that any subject which emphasises particular items of knowledge and does not stimulate generalization is educationally barren.

3. Theory of Similar Though Not Identical Element

This theory states that relationship between learning situations could be due to the fact that they have components of general principles which are similar though not identical. This theory establishes the rules that prediction of transfer is possible when a combination of conditions relating to tasks has similar relationships. Thus, transfer problem cannot be taken on the basis of abstract analysis of human skills. It has very practical educational significance.

A Few Comments on Theories of Transfer of Learning

Although theories on transfer advocated by Thorndike and Judd appear to be professing two different generalizations, it would, however, appear clear that there is not much contradiction in these views. Identical elements in Judd's generalization may be the specific habits of language engendered by the process.

Webb, however, puts another argument on the validity and adequacy of three theories. He states that the aforesaid theories hardly answer the query as to the cause of transfer. They merely appear to be descriptions of where and how transfer may take place. He concludes that at the present time there is no adequate theory of the cause of transfer. Aforesaid theories have certain features which can be advantageously employed in educational situations. Both the theories have certain good points in them which can be successfully utilised by educational workers for maximising the effect on a learning experience.

POSITIVE AND NEGATIVE TRANSFER

Various experiments on transfer have shown that results of transfer are relative. Transfer can be positive or it can be negative. When it is positive, performance on task A will be higher and positive after some practice on task B. If a subject helps in the building up of large profits of learning, such a result will lead towards positive transfer. A few research studies have been undertaken to study the influence of French in studying English. It was found that French aids somewhat in increasing the rate of reading English.

It is also found that English sentence structure and vocabulary are improved very little by the study of French. A psychologist named Orata summarised the results from experiments on transfer carried out between 1890 to 1935. He states that 28 per cent show considerable transfer; 48 per cent appreciable transfer; 9 per cent very little transfer; 3.6 per cent no transfer; 7.2 per cent transfer and interference; and 3 per cent interference.

The results support the view that transfer of learning is a positive phenomenon.

Transfer can be positive in a learning situation under the following conditions:

1. Methods of memorization can improve transfer.
2. Attitude of students towards learning can influence transfer.
3. The degree of mastery of the material learned in one condition also influence the degree of transfer.
4. Methods of instruction also improve transfer.
5. The generalizing of an experience also helps transfer.

Negative Transfer

By negative transfer is implied the fact that a second task containing the same stimuli but requiring totally unrelated responses should produce negative transfer. It should be more difficult to learn a second task where transfer is negative. It has been found that the only condition that consistently produces net negative transfer is one in which the same responses are used in paired-associate learning but are rearranged. Under these conditions, the subjects learn new pairing of old responses and this condition nearly always produces large amount of negative transfer. Experiments on transfer have shown that negative transfer takes place when new responses have to be learned or old ones rearranged. It has been found that the greatest amount of negative transfer comes from the rearrangement of the original responses. It is felt that it is always harder to learn rearranged pairs than to learn paired associated with no previous practice at paired-associate learning. When responses become more and more unrelated, negative transfer develops.

Thus, it is evident that unrelated responses between the two learning situations produces negative transfer. However, Bugelski and Codwallader have also found that negative transfer could take place when responses were similar. The limit or negative transfer is not set by the commonality between the requirements of tasks. It is set by the conditions which induce human beings to try to give up the application of old habits. Conditions that reduce negative transfer are :

1. Low similarity.
2. Punishment of particular attempts done wrongly.
3. Extinction of wrong actions which will reduce negative transfer.

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PROGRAMMED LEARNING AND EDUCATIONAL TECHNOLOGY

Teaching and learning process are as old as human beings and the process has undergone significant and sometimes extraordinary changes through ages and the present status of classroom instruction with the help of educational technology including teaching machine and programmed instructional materials is the result of continuous and scholarly endeavour of psychologists, educationists and technologists since the beginning of the twentieth century. The aims, in this present chapter, is to present a few facts about the development and functioning of self-instructional techniques in two parts—'A' dealing with programmed learning and 'B' dealing with educational technology—with special reference to Indian context.

A—Programmed Learning

The development of programmed instruction or programmed learning, as they say in Britain, is based on extensive researches on operant conditioning advanced by Skinner and others. Operant conditioning deals with the principle of reinforcement to change behaviour in successive approximation to a pre-fixed desired goal. The American writers view programmed instruction as a process of 'arranging materials to be learned in a series of small steps designed to lead a learner through self-instruction from what he knows to the unknown of new and more complex knowledge and principles'. J.E. Espich and B. Williams in their book 'Developing Programmed Instructional Materials' have stated that programmed instruction is 'a planned sequence of experiences, leading to proficiency in terms of stimulus response relationship'.

E.L. Thorndike's findings of 'Law of Effect' has direct bearing on the principles of programming. His law states that learning is likely to be more permanent in the learner if it is accompanied by satisfaction than by dissatisfaction. The reward that the learner receives provides for reinforcement. Actions that are successful are repeated again and again than actions providing discomfort.

S.L. Pressey also exerted high influence with his invention of the first teaching machine in the twenties. Lumsdaine and Glasser also in the early thirties and forties made sporadic contributions to the field. But it is B.F. Skinner of Harvard University who on the basis of his extensive researches on pigeons and rats, developed the learning theory of operant conditioning that has direct bearing on and high influence upon the principles of programmed instruction. His teaching-learning model is popularly known as 'programmed instruction'.

Principles: The principles of programmed learning are as follows:

(i) *Small Steps:* The materials to be programmed are divided into meaningful segments and are presented through small steps.

(ii) *Immediate Confirmation or Feedback:* As soon as the learner proceeds through programmes, his response is immediately confirmed as to be either correct or incorrect by knowledge of results (KR) and feedback is immediately provided.

(iii) *Active Responding:* For the go of any programme the learner has to anyhow respond. Response is the core of programmed learning that keeps the learner busy throughout the programme.

(iv) *Self-pacing:* An individual learner proceeds through a programme at his own pace without any care for the group. He is not forced to move quickly by the teacher without mastery.

(v) *Student Testing:* Regular and continuous testing of the effectiveness of the programme to the particular individual learner is conducted by the teacher with a view to improve upon it.

Advantages: Programmed instruction has innumerable advantages over the traditional methods of learning that have been proved through research. A few of those are enumerated as under:

(i) Foreign languages, drill in spelling, factual information can best be taught through programmed instruction.

(ii) Teachers being free from routinized classroom activities can devote more independent time and thinking more creatively in case of programmed instruction.

(iii) Social and emotional problems, especially in the West, have been effectively dealt through programmed instruction in the classroom. The self-instructional materials have successfully eliminated the problem of indiscipline inside the class.

(iv) It caters for the individual needs through individualised

instruction and self-pacing and can better serve a heterogeneous population of learners.

(v) It helps the teacher to clearly diagnose the needs and problems of the individual learner and correct those at personal basis without any delay that is quite absent in a traditional classroom of uncountable students.

(vi) Learning becomes interesting through programmed instruction. It provides challenge to the individual learner to utilize his ability to the full extent. Confirmation of correct responses provides sufficient motivation to proceed at a quicker speed towards cent-per cent mastery.

Application: Programmed instruction can be applied wherever learning occurs—whether in the classroom or in the industrial setting. In the classroom, it helps in regular instruction, enrichment of learning and for remedial instruction. In industry, it helps disseminating the technical innovations through refresher courses for up-to-date professional development. This can also be applied in teaching Military Sciences and in defence. As for example teaching of electronic trouble-shooting course to naval trainees becomes easier and effective through programmed instruction.

Programmed Learning: Early Approaches

Though a serious thought was given to the concept of programmed learning in the early part of the twentieth century, however, historically speaking, Socrates may be termed as the first-programme in geometry. Even in the Gita, the Indian holy scripture, one well smells out programmed instruction in its process of teaching learning viz., initial behaviour, small steps, immediate confirmation and self-evaluation. Many a psychologist has contributed to the early development of programmed instruction as a scientific method of teaching-learning but mention would be made of those whose contributions are the most relevant to the development of the present form of it.

S.L. Pressey

The first place in the history of programmed learning may be credited to Sidney L. Pressey of Ohio State University, for he was among those pioneer psychologists who tried to translate the laws of learning into instructional devices. Pressey (1926) was interested to develop a simple scoring device to test the achievement of a learner after teaching. The devices followed by him were quite mechanical in which learners were presented with multiple-choice items (having four options out of which one is correct) and the immediate confirmation of the correctness of their choice of answers. This way an immediate feedback is also provided. Selection of the correct answer to one item leads to

presentation of next item by the machine; and if the answer is incorrect, the student continues responding till the selection of the correct response.

The earlier mechanical devices have been replaced by simple devices, such as, punch-boards and chemo-cards. In case of the use of punch-board, for example, a learner, after studying some learning materials, is presented with a set of test questions with alternative answers for each question. Among those only one answer is correct and a board punched with a set of holes to match the choice of alternative answers is provided to him. He pushes a stylus into the hole that corresponds to his choice of correct answer to a particular question. If the chosen answer is right, the stylus passes through a concealed template thereby confirming the correctness (or not) of his answer out of multiple-choice answers.

It is to be noted here that Pressey's devices are 'testing' rather than 'teaching' devices, for they are used 'after' instruction and not 'before' it. This is popularly known as 'adjunct programming' in which 'after' usual conventional instruction the programmes are used to 'test' achievement. In Fig. 1 an example of adjunct programme has been presented (Bell, *et al.*, 1964).

-
36. Identical twins are used as subjects in studies of the role of environment in the development of ability because such persons have the same
- | | | |
|----------------|----------------|---|
| A. environment | C. development | B |
| B. heredity | D. discernment | |
-
37. Newman *et al.* (1937) found that measures of height for identical twins reared together had a correlation coefficient of .98 and identical twins reared separately had a correlation coefficient of .97. Hence the effect of height of being reared apart is
- | | | |
|----------------|----------------|---|
| A. inverse | C. significant | B |
| B. meaningless | D. slight | |
-
38. Newman also found that the achievement test scores for identical twins reared together showed a correlation of .96: for identical twins reared apart it was .51. The difference is
- | | | |
|----------------|----------------|---|
| A. inverse | C. significant | C |
| B. meaningless | D. slight | |
-
39. Intelligence test score correlations were found by Newman to be .96 for identical reared together, .67 for those reared

apart. This tends to emphasize the importance of . . . in the development of intelligence.

A. weight

C. hereditary

B. height

D. environment

D

Fig. 1 An example of adjunct programme

The important advantages of this programming are that there is easy and quick preparation of materials, and that textbooks and material already available to the student or teacher can be used for the purpose. The drawbacks of adjunct programming indicate that the learner is merely to recognize the correct response from a number of responses, and that material presented to the learner is not in sequential order, i.e. from simple to complex.

B.F. Skinner

Prof. B.F. Skinner of Harvard University whose widespread and controversial views on teaching and learning, so to say education, brought him the honour—'the father of programmed learning'—delivered a paper entitled, "The Science of Learning and the Art of Teaching" (Skinner, 1954) in Pittsburg in which he pointed out the fundamental limitations of American education and some suggestions to improve that upon. He pointed out four major limitations from which the conventional American schools were suffering:

(i) The student being afraid of negative evaluations, threats and punishments learned to escape from those.

(ii) The complete absence of programmes led the learner move through a series of progressive approximations till the last required complex behaviour was reached.

(iii) The possibility of the teacher to physically reinforce each student in a class as and when a correct response was put forward was limited; so to say there was no optimum contingency of reinforcement.

(iv) There was infrequent reinforcement on the part of the teacher in the classroom that did not help in providing the stimulus to strengthen the particular behaviour and help its reoccurrence.

The Indian scene is, at present, no less better, and suffers from the same limitations.

Professor Skinner's answer to these limitations was the development of linear style of programming (or Skinnerian programming as sometimes it is so called) that was based on the principle that a learner's original response should be either modified or confirmed until he met the acceptable performance, and a person's behaviour can be modified through successive approximations. Students, he

contends, can be taught the best when the subject-matter is broken into meaningful segments of information and the small steps are written in such a way that there is possibility of the correct responses to occur always. The student is also immediately provided with the knowledge of result (KR) of his performance.

He adheres to the view that recall responses are more efficient in the process of learning than the recognition type of responses, and learning occurs only when a learner responds to. Fig. 2 illustrates an extract of linear programme (Milton and West, 1961):

A second important condition for efficient learning is the presentation of subject matter in a series of 'small logical' steps. The learner must master step A before he can grasp—B		20
Step	An ancient Greek fable tells us that Milo was able to lift his full grown bull because he had lifted it daily since it was a calf. Since the animal had 'small' increases in weight daily, Milo's weight-lifting 'program' progressed through a series of many—steps.	21
20		
small	Unfortunately, under usual classroom conditions it is difficult for the instructor to present subject matter in steps which are sufficiently—in size.	22
21		
small	A later item in this program—to which you probably cannot yet respond correctly—reads 'Another condition is that each response is followed by . . . That item is a large step beyond the present one. However, after being led through many—steps, you will later be able to—correctly.	23
22		
small respond	This program may seem annoyingly simple. But the merit of a step-by-step presentation of subject matter is shown by the fact that you have made few, if any, incorrect—to the statements or stimuli of this program.	24
23		
responses		
24		

Fig. 2 An example of linear programme

The basic principles on which Skinnerian programming is based are: (i) there is linear or straight-line arrangement of material through steps from initial behaviour to terminal behaviour, (ii) responses are controlled by the programmer, (iii) the learner anyhow responds to each frame without any threat of punishment or failure, (iv) the skilful programme helps the learner move one step at a time from simple to more complex behaviour, (v) there is self-pacing on the part of the learner at his convenience and immediate and frequent reinforcement in the form of feedback is provided as soon as he responds to each frame, (vi) prompts or additional stimuli are provided to quickly find out correct response and save time.

Though several varieties of machines have already been developed to provide the self-paced reinforcement step-by-step to the individual learner, however, the mechanical presentation on the programme does not create any problem; rather the difficulty lies in the writing of the programme. The limitations of this programming include: (i) lack of motivation on the part of both teachers and students in case of easily understood materials or learners involving gifted ones, (ii) lack of freedom of choice that inhibits creative imagination and judgement, (iii) limited application in those disciplines (like science, mathematics, etc.) in which subject-matter can be properly sequenced, (iv) boredom after first few hours of programmed instruction, (v) lack of provision for individual differences, and the like. However, it has been seen that generally the learners enjoy the pressing buttons and do not feel that the extent of materials to be learnt is beyond their capacity (because of the hidden stock of materials). But at present the Skinnerian programming is subjected to several research and criticism (Hartley, 1974).

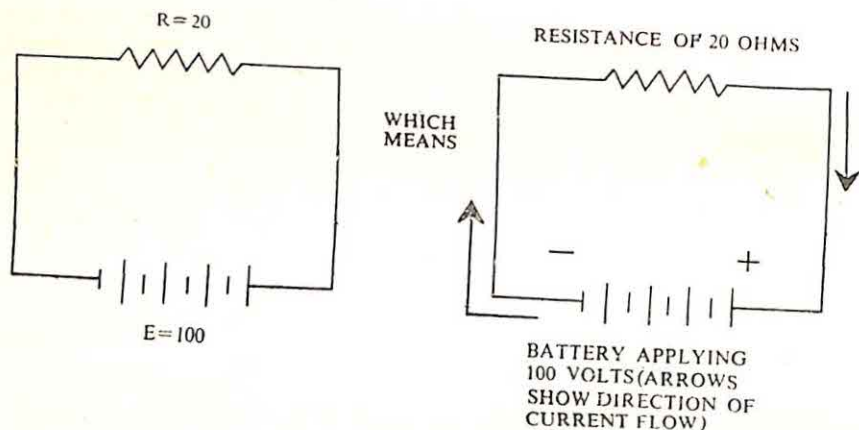
N.A. Crowder: Towards 1954, Norman A. Crowder, a technician in the United States Air Force, had to deal with the vocational training of the trainees of aircraft maintenance who were busy in repairing the faults in aircraft engines. His main problem was to improve upon and accelerating the speed of learning without any drop-out and with minimum number of possible errors. So a type of programming was developed, known as Crowderian or branching or intrinsic style of programming, in which the learner himself makes the decision to adopt instruction as per his needs without any extrinsic interference (such as computer). Basically, Crowder was not interested in theories of learning, rather in successful communication of the materials (Crowder, 1960). This intrinsic style is based on the principle that individual differences exist in needing instructional materials and students can learn better from their self-committed errors than from any outside interference or dictation.

In branching programming, a learner is presented a small paragraph of information and is asked a question about it having a

number of alternative answers (among which one is correct). If he chooses the correct answer, the next paragraph is presented with fresh information, and if the answer is incorrect, the error is dictated and he is directed to go back to the first question and restart. Sometimes remedial sequence is provided if the error is a serious one. Recently, a machine naming 'Autotutor' has been developed that uses this technique of communication of information. In Fig. 3 an example of branching programme is depicted (Hughes and Pipe, 1961):

Your Answer: 5 amperes.

Correct. With a voltage of 100 and a resistance of 20 ohms we apply Ohm's Law, $I = E/R$, to get a current of $100/20=5$ amps. This is a simple circuit and it can be shown as the diagram at left:



And this should look familiar by now. Remember the formula for calculating watts, $P=EI$? Given any two quantities, you can solve for the unknown.

The same is true for Ohm's Law. If you know voltage and current, you can find resistance. If you know resistance and current, you can find voltage. If you know voltage and resistance, you can find current.

How?

If $I=E/R$, then $E=I/R$ and $R=E/I$ page 49

If $I=E/R$, then $E=IR$ and $R=E/I$ page 52

If $I=E/R$, then $E=IR$ and $R=I/E$ page 55

If $I=E/R$, then I don't know what comes next page 61

Fig. 3. An example of branching programme

The advantages of branching system of programming include (i) in comparison with the linear programming, the Crowderian

style provides for individual differences in knowledge and comprehension, (ii) older and highly intelligent students find it more suitable, for larger items of information are presented at a time, (iii) it is more suitable in subjects involving complex problem-solving strategies that can be developed systematically one stage after another.

But Crowder is not free from criticism. First, when he believes in achieving 85 per cent correct response rate for the main sequence items, there is less chance of branching of sequences than is usually thought of. Second, the level of content and diagnostic questions are decided by the programmer, hence less care is provided for the needs of individual learners, especially the gifted. Third, it can be used after grades VI, for small children, find it difficult to follow its mechanisms. Moreover, its cost of preparation is higher than the linear style of programming.

THE LATE DEVELOPERS

R.F. Mager

Robert F. Mager who was working in the context of industrial training became dissatisfied with the classical models of programmed instruction, as discussed earlier, in which the sequences are developed by the programmer. But his view was that the learner (not the instructor or programmer) should have control over the sequencing of topics to be learned. This is called the 'learner-controlled instruction' (LCI) in which students can ask as many questions as they wish to know about a topic (for example, electronics) and proceed in learning the materials with the help of the instructor who acts only as a resource person (Mager, 1961). This is just the reverse of Socratic dialogue (in which the teacher leads and students follow), and here the learner leads the instructor by asking questions.

It differs from the traditional styles of instruction in that: (i) it deals with the concrete, rather than abstract aspect of students' interest, with 'how' rather than 'why' of anything—as for example, in electronics, instructor-generated sequences (traditional style) start with electronic theory or magnetism, while in LCI (student-generated sequences) the start is usually made with the vacuum tube, (ii) in LCI students' interest in function before structure (or the actual happening before its causes) is taken into account—for instance, in electronics students first become interested to be explained of what 'happens' to generate a picture on a TV screen before the question of the 'causes' of the movement of electronic beam backward and forward, (iii) students generally tend to proceed from simple to more complex 'whole'—as in case of electronics they ask questions regarding how radio works before asking about what makes it work. Similarly, the teachers or instructors also proceed from simple to complex whole.

The learner-controlled instruction has more specific advantages over the traditional styles of programming. First, learning becomes more effective only when the learner himself develops the structure of learning and organizes the learning sequences that are met with in the LCI. Second, it creates more curiosity and high motivation in the learner, for there is no imposition from outside agency. Third, learner is consulted to help the instructor to maximize the effectiveness of the already-developed sequences.

Development of separate programmes for each learner that is costly and time consuming, the inability of the learner in sequencing his learning task or his inability to stimulate the teacher, the dominance of learner over the reorientation of teacher training in the developing countries are some of the limitations of the style of instruction developed by Mager.

T.F. Gilbert

In 1962, Thomas F. Gilbert and his associates developed a quite potential but controversial system of programming called, "mathematics". The meaning of Greek word 'mathein' from which the coinage 'mathematics' has been derived is to learn. It has got many a similarity with the other styles of programming. It is akin to that of Skinner in that it is linear in format. Unlike the predecessors' stress on learner's interest or viewpoint, Gilbert's stress centres round the programme writers. Motivation and feeling of mastery on the part of the learner are given high importance, and larger steps in programmes than that of Skinner are adopted. Like Mager, Gilbert also plans to tell the learner before hand the terminal behaviour or end goal of the instruction. The deviance of mathematics than the earlier approaches is that the process of programming is perspective rather than descriptive. He advocates for both theoretical and practical aspects of programming (Gilbert, 1962)—as for example, the principles for the reduction of effective instruction are put forward like Skinner, Crowder, etc., along with the prescription of a systematic methodology.

Mathematical programmes have already been developed in the areas needing psycho-motor skills, such as, electrical appliance repair, radio-television repair, sewing, automobile servicing, welding brick, etc. that involves transfer of skills. These programmes can be developed in areas of cognitive and affective domains also. In all cases, programme development in mathematics needs three 'a priori' preparation: (i) the step the student is to adopt to master subject, (ii) arrangement of the conditions (concerning motivation and reinforcement to the student) of his taking these steps, (iii) careful instruction to him in such a way that he can achieve the mastery at a quick succession. Davies (1969, 1972) in his writings in which he has given more complete and technical accounts of these pre-conditions has pointed out that the problem of design

needs the highest emphasis in the development of mathematical programmes.

Generally, five steps viz. (i) data collection and task analysis, (ii) writing a learning prescription, (iii) characterisation and lesson plan, (iv) frame or exercise writing, and (v) editing are followed. To acquaint the student with the processes of demonstration, prompt and release in an exercise, the process of chaining is adopted. Besides the advantages of mathematical programmes over other styles of programming, at least three loopholes can be pointed out, i.e., first, it is a time-consuming affair; second, it is a highly complicated process involving superior skills and competence; and third, it necessitates increased fabrication cost especially in case of the use of simulators and kits. Moreover, the application of the process of backward chaining needs high expertise especially to apply in actual training situations.

Gordon Pask

A note on the pioneers of programmed learning would remain incomplete without the mentioning of Gordon Pask who since the 1950's has been wholeheartedly contributing to the field. In his early papers (Pask, 1960) he was contributing to the application of programmes to the design of machinery for the teaching of manual skills. Lewis (1963) has pointed out that, his contribution be termed as 'adaptive instruction' i.e., either speeding up or slowing down the instruction in accordance with learner's difficulties. Pask completely rejected the Skinnerian principles and processes that helped him to suit his approach more to computer-assisted learning (Pask, 1975a, 1975b). His later writings are concerned with task analysis (Pask, 1976a) and individual differences in learners (Pask, 1976b).

Comparative Studies

Towards the 1950's and 1960's, quite a significant number of studies had been undertaken to compare the effectiveness of all the systems of programmed instruction; and the comparison between the effectiveness of programmed learning on the one hand, and conventional instruction on the other. A summary of the results of 120 findings pooled by Hartley (1966) has been presented in Table 1.

The results indicate that programmed instruction, in most of the studies, is more effective than the conventional instruction. Hartley (1972) has pointed out that out of 12 studies comparing the effectiveness between both the combination of programme and instructor on the one hand, and either the programme or the instructor on the other, 11 studies reveal that both the instructor-cum-programme is the best method of all. The cost-effectiveness

TABLE 1

The results of 112 studies comparing Programmed with Conventional Instruction

<i>Measures recorded</i>	<i>Number of studies recording these measures</i>	<i>Programmed Significantly superior</i>	<i>Instruction Not significantly different</i>	<i>Group Significantly worse</i>
Time taken	90	47	37	6
Test results	110	41	54	15
Retest results	33	6	24	3

Note: Figures in the first column differ because not all three measures are recorded for every one of the 112 studies.

of some industrial studies summarized by Hartley (1972) has been presented in Table 2.

Studies by Stewart and Chown (1965), Taylor and Reid (1965), Dodd (1967), Neale *et al.* (1968), J. Mieson (1969), Green (1970), Evans (1975), and Mackie (1975) conducted on adult and older persons suggest that there does not exist any simple method (as may be called programmed learning) that can be quite appropriate for everyone of the group of a given age engaged in a given task. These studies further reveal that for longer sessions older learners like to work with programmes than the younger ones and it provides better results when more activity is built into the programme. Belbin (1965) reports that discovery oriented approach is more preferred by older learners than a didactic 'telling' approach.

These days, programmed learning has also been introduced and applied in the military and in industry. This has been, at least, helpful in providing training in specific skills, general educational and background courses in the industries. In advanced countries, it is also applied in companies like, banks, airline and oil companies, building societies, for instruction. And, moreover, in the system of education through correspondence, programmed texts have been proved to be highly essential and complementary. At the present juncture of high importance given to life long education or 'education permanente', the high necessity of self-instructional text-books cannot be ruled out.

Indian Researches

In India, a large portion of researches in educational technology is occupied by programmed learning. Consciousness among Indian educationists of the technological developments in the field of teaching and learning elsewhere started towards the early 1960's and got impetus when the Department of Educational Psychology and Foundations of Education, NCERT started communicating these new ideas to teachers, administrators, planners, educational thinkers, and industrial workers through seminars, symposia, workshops, etc. NCERT also started preparing and developing programmed learning materials in different Indian regional languages. As a result, the M.S. University, Baroda first introduced a paper on 'Educational Technology and Programmed Learning' at M.Ed. level in 1966, and consequently the Indian Association for Programmed Learning was set up in 1967. Mainly, researches on programmed learning are being conducted in CASE (Baroda), NCERT (Delhi), and Meerut University and a few State Institutes of Education, and Colleges of Education. In this section, a survey of researches in programmed learning at doctoral level is made.

A major research area has been made the comparison of the effectiveness of the programmed learning approach and the traditional

TABLE 2
Some Cost Benefit of Programmed Instructor in Industrial Contexts

<i>Investigator</i>	<i>Cost of programme</i>	<i>Cost of conventional instruction</i>	<i>Estimated savings</i>
American Bankers Association, Ofiesh, 1965	—	—	20%—50% training time
American Telephone and Telegraph Co. (Ofiesh, 1965)	\$ 218 per student hour	\$ 309 per student hour	29% of instruction 27% of trainee time \$ 90,000 in training to date (\$ 30/man)
Union Carbide Chemicals Co. Ofiesh, 1965)	—	—	
Holme and Mabbs (1967)	£ 1,500	£ 1,500	£ 1,500 per yr.
Hall and Fletcher (1967)	£ 20,000	—	1 week's trainee time Approx. £ 10,000 per yr.
Oates and Robinson (1968)	£ 12,500	—	8.2% of training time
Watson (1968)	—	—	£ 24,700 after 2 yrs. 3 hrs. per supervisor
Mills (1968)	£ 550	—	£ 90,000 per course
Howe (1968)	£ 13,500	—	£ 1,275 annually
Jones and Moxham (1969)	—	—	£ 1,000 for every 3 courses 10 weeks' trainee time Labour turnover reducing from 70% to 30%. Retention of skilled labour

approach to teaching. Generally, the programmes and criterion tests were developed in subjects like mathematics, geography and languages. Shah (1964) conducted a study with a programme on 'Solving Equations'. Sharma (1966a) and Sharma (1966b) administered programmes on geography and algebra respectively. A programmed material on 'Teaching of Gujarati in Standard IX' was developed by Desai (1966). Shah (1969) conducted an intensive study covering the whole syllabus of Algebra of standard VIII. The SIE (1970a) also studied the effectiveness of programmed materials over traditional approach. All the findings revealed that learners taught through programmed learning method achieved higher scores on criterion (post-test) tests than those taught through traditional classroom teaching, thus proving higher effectiveness of programmed instruction method over the traditional approaches to teaching-learning. The effectiveness of programmed learning approach in terms of time taken to learn a particular topic (besides in terms of immediate and delayed achievement) was confirmed by Shah (1964) and Shah (1969).

Desai (1966) in a study, taking into account pupils' reactions, found that they had higher preference for programmed learning than traditional approach to learning. In physics, Pandya (1974) found that the programmed learning strategy was more effective than the others. A definite superiority of programmed instruction over traditional method in the instruction of language was revealed by Reddy (1975). Though the abovementioned various studies prove the higher effectiveness of the programmed learning approach over the conventional method; however, the study by Shah (1964) clearly depicted that in a comparison among three groups—one with self-assisted programmed material, another with programmed material with teacher's help, and the third taught through traditional method of teaching—the learners in the second group (taught through programmed materials with teachers help) had failed to do better than others.

Can the Early Approaches to Programmed Learning be Combined?

In the early researches of programmed learning there was high concentration on the relative effectiveness of different approaches to it. But, as an extension of the concept, researches are being carried out to combine the different approaches and maximize the output. As for instance, a new system called 'skip-branching' was developed in the university of Sheffield (Kay to Sime, 1963) in which both Crowderian system (large unit of information) as first step and Skinnerian system (making a written response) as second step were combined. If the student's answer was correct, he moved on to the next unit of information; and if incorrect he again works on small items of linear subsequence that lead to the next unit of information and the same procedure is repeated for mastering all the units of information.

The important discrimination/improvement of the present day approaches over the early approaches is that the latter was machine-oriented and the former student-oriented. Previously, the format of the programme was influenced and controlled by its method of presentation than by the consideration of learners appropriate action at that particular moment. The modern programmes are more flexible than the early ones (that provide for a combination of various approaches at its right moment (Markle, 1969).

Programmed Instruction—Conceptual Expansion

Hartley (1974) has mentioned that a major shift from the actions of learners to those of programme writers has been made in the middle 1960's, thereby indicating the restriction of psychological foundations of the programmed learning upto that stage (Annett, 1973). In its wider concept and application, a programme goes through four interrelated steps, viz., (i) specification of objectives, (ii) analysis of the learners' task and selection of appropriate teaching methods and media, (iii) evaluation, and (iv) revision. At the second step, a programme may combine a variety of methods—conventional/modern, hardware/software, etc.—and can take the help of packages containing tapes, visual aids, slides, programmed and conventional instructional materials, and so on without solely depending on the single programmed textbook only. Mackie (1975) has further described the more modern approaches to programmed instruction. Even programmes have been developed and used with management personnel, administrative and clerical staff, etc., unlike its limited use with only the operators or apprentices in the industry (Whitlock, 1972).

Programmed Learning and the Computer

The highest achievement in human pedagogy is not only the discovery but the application of computer in the teaching-learning syndrome. Computers can store large amount of information at a time, are flexible, and can set aright information speedily. The computer-assisted instruction (CAI) is claimed to be a separate entity than being included under the heading programmed learning, for researches on computer are independent of computer and working with computer does not necessarily mean that one should be a psychologist. Since 1950, researchers have been doing research on computer and programmed learning separately. The only justification to include CAI as a sophisticated extension of programmed learning would be that both the methods have similar aims, viz., efficient, effective and economic teaching.

Each learner's teaching strategy attended to in CAI according to his preferred learning style through Time Shared Interactive Computer Controlled Information Television (TICCIT), unlike the earlier approaches. A computer system has three aspects : (i) the physical

aspects—the computer, the light pens, the terminal—or the hardware, (ii) the operating system and the internal operation—the ‘software’ and (iii) the instructional materials—the ‘courseware’. There are five kinds of teaching strategies used in CAI that have been discussed below:

(i) *Drill and practice* : It is the commonly used form of CAI and there is high effectiveness of CAI at this level (Atkinson, 1974). The computer, at this level, being less adventurous, supplies examples (in arithmetic or algebra), administers and scores of these exercises. Simultaneously, the students discover strategies for themselves, and through this process sudden insights or ‘aha’s’ can be achieved. This approach aims at helping students develop and practise skills under controlled conditions.

(ii) *Tutorial* : This level is equal to that of drill and practice except the use of teleprinter that helps in providing more dialogue between the computer and the learner. The presentation of next materials depends upon the response, time taken and mastery of the concept by the learner. The learning sequence here is determined by the learner’s requests to the computer.

(iii) *Laboratory tests, simulations and gaming* : Here, the computers help in simulating some of the activities involved in it, for example, management decision-making, chemical laboratories etc., to help acquiring skills in less time and danger of real-life activities. Moreover, the computer can also be used to assess the implications of present decisions for the future.

(iv) *Using students to write programmes* : CAI also helps learners to write their own programmes. Papert (1972) has found that children learn by doing and they can carry out exciting projects with an access to computers and with clear and intelligible programming language. And, moreover, writing one’s own programme helps in the development of logical thinking skills.

(v) *Computer-managed instruction* : Besides teaching, computer can also help others teach or work in the school or college. For example, it can help in the preparation of time table, scoring objective tests, diagnose learning difficulties, and the like.

The latest developments in computer are PLATO (Programmed Logic for Automated Teaching Operation) and SOCRATES (System for Organising Content to Review and Teach Educational Subjects)—the former helps in reducing costs and the latter developed at the University of Illinois by Stolurow is more sophisticated in terms of instructional design.

Advantages : CAI is especially helpful where there is a need to measure learner’s response, evaluate it and communicate to himself or the teaching programme before the next response. Second, in problem-solving and training of high-speed motor skills, the CAI

serves the most. Third, individual differences in the learners to a larger extent are dealt with by CAI appropriately. Fourth, unquestionably, the computer is the best record keeper and decision-maker than the teacher under controlled conditions.

Limitations : (i) The learner just makes a mechanical response to the computer by just pressing a button or typing on a teletype that is not possible in case of speech analysis or writing analysis.

(ii) Responses provided in a computer are limited in number and provide for mechanical grasping that hinders creative imagination and production.

(iii) Most important is the emotional climate found in the class between the teacher and the taught that is quite absent in the CAI.

(iv) It does not help in the development of language competency in constructing meaningful sentences.

B—Educational Technology

In the last few decades, technology in education has progressed so tremendously in the developed nations that the developing and under-developed countries could hardly survive without letting the imported technology an inroad into the country's traditional system of education and socio-economic life. So educational technology is a novel field of education and is the mechanization of educational process. The traditional concept of educational technology as the use of audio-visual aids and teaching materials in the classroom instruction has considerably been changed with due application of sophisticated machines like computer in teaching-learning process.

Educational technology, as commonly understood, is the application of technology in the field of education to improve upon the process of teaching and learning. In 1971, the National Council on Educational Technology referred it as 'application of systems techniques and aids to improve the process of human learning'. Robert M. Gagne defines it as the 'development of set of systematic techniques accompanying practical knowledge for designing testing and operating schools as educational systems. 'Gagne refers to development of teaching techniques measuring instruments to test students' performance. Unwin adheres the view that educational technology is the application of modern skills and techniques to requirements of education and training, and use of media and methods to facilitate learning, as well as the control of environment for effective learning. Davies views it to be a systematic approach to the organization of resources for learning. Robert Cox has put forward a comprehensive definition of educational technology as 'the systematic application of scientific knowledge about teaching learning and conditions of learning to improve

the efficiency of teaching and training. In the absence of scientifically established principles, educational technology implements techniques of empirical testing to improve learning situations.' Educational technology strives for optimum utilization of existing human and non-human resources to improve upon definition of objectives, teaching-learning strategies, and evaluation of the behavioural objectives.

Types

Educational technology can either be hardware or software. In the hardware approach, there is complete mechanization of the process of education. It especially deals with the application of engineering or physical sciences to education and training with the assumption that technology of machine is closely related to the technology of teaching. These include the application of teaching machines, radio, television, tape-recorder, record-player, radio-vision, video-tape, projectors, and the like in instruction. This is referred to as 'relative technology' by Silverman, for there is borrowing and application of mechanical and technological devices in the process of teaching and learning.

The software approach or instructional technology refers to the application of behavioural science to the problem of learning and motivation, and a direct and deliberate shaping of behaviour. This is what is called teaching technology or instructional technology in which programmed learning is included. This can broadly be divided into three categories, viz. (i) teaching technology (propounded by Herbart, Hunt, Davis, Bruner), with the objectives of development of all the cognitive, effective and psychomotor domains, (ii) programmed instruction (propounded by Ausubel, Glaser, Skinner, etc.) that aims at developing the cognitive domain, and (iii) behavioural technology (developed by Flanders and Amidson) with the objective of development of psychomotor domain alongwith the cognitive and effective ones.

Objectives

Being a recent and new approach to improve upon teaching-learning process, the objectives of educational technology are to be decided upon on a priority basis. The main objectives are:

(i) to provide self-instructional programmed material for individualized instruction, (ii) to improve upon the quality of instruction and learning with the help of sophisticated devices like, TV and Computer, (iii) to meet the problem of quantity in education by catering the needs of hundreds of thousands of fresh first-generation learners, (iv) to equalize educational opportunity irrespective of economic, social or geographical conditions of the learners and (v) to help augment the modern trends in education like, lifelong continuing education, education permanente, etc., through TV, distance learning, and self-instructional materials.

Modification of Teacher Behaviour

The introduction of technology into the field of education has affected teaching, instruction, behaviour of teacher and instructional designs. Accordingly, educational technology has been sub-divided into four categories, viz. (i) teaching technology, (ii) instructional technology, (iii) behavioural technology, and (iv) instructional designs. The contents of the teaching technology include planning, organization, leading and controlling of teaching; and in this context Glaser has pointed out four steps in a successful teaching model : (i) instructional objectives, (ii) entering behaviour, (iii) instructional procedures, and (iv) assessment of performance. Instructional technology developed by Skinner, Crowder, Mager, Gilbert, and others is designed to apply the psychological and scientific principles in instruction to achieve pre-fixed specific objectives. Behavioural technology attempts to scientifically design training to modify teacher behaviour. The exponents in the line include Flanders, Amidon and a few other behavioural technologists who have developed the system of observation for classroom interaction, micro-teaching, simulated skill training, team teaching, etc. The fourth type of educational technology, i.e., the instructional design refers to training psychology (task analysis), cybernetic psychology (feedback and reinforcement and system analysis (developing system of instruction and teaching). The most important of all has been the behavioural technology in which teacher training is scientifically re-oriented so as to ensure modification in teacher behaviour for effective and efficient teaching. In the following pages are discussed some of the behavioural technology under four headings : (a) classroom interaction, (b) simulated teaching, (c) micro-teaching, (d) T-group training.

(a) Classroom Interaction Analysis

One is forced to misconceive teaching when one finds that a teacher continuously either asks questions or gives lectures to the entire class without any interaction. Teaching is a two-way process and the teacher and the taught influence each other in this process. The teacher gives directions, lectures, praises and encourages students, criticizes their behaviour, and so on. A student/or students on their part respond to the teacher's stimulus, initiate certain activities and so on. So teaching is certainly an interactive process where teacher and students reciprocate equally. Classroom interaction analysis is 'any system for coding spontaneous verbal communication, arranging the idea into a useful display, and then analyzing the results, in order to study patterns of teaching and learning'. So it is an observational procedure to help recording the spontaneous acts of the teacher and scrutinizing the instructional process with due consideration to each bit of interaction.

The objectives of interaction analysis include : (i) to achieve a

TABLE 3
Flander's Interaction on Analysis Category

Teacher Talk		Student Talk		Silence
Indirect Influence	Direct Influence			
1. <i>Accepts Feeling</i> : Accepts and clarifies the tone of feeling of the students in an unthreatening manner. Feelings may be positive or negative. Predicting and realizing feelings are included.	5. <i>Lecturing</i> : Giving facts for opinions about content or procedure expressing his own ideas, asking historical questions.	8. <i>Student</i> <i>Talk-Response</i> : Talk by students in response to teacher. Teacher initiates the contact or solicits students statement.	10. <i>Silence or confusion</i> : Pauses, short periods of silence and periods of confusion in which communication cannot be understood by the observer.	
2. <i>Praises of Encourages</i> : Praises or encourages student action or behaviour, exa., "Um Hm?", "Go on", "Right", "Oh, Yes", etc. that release tension.	6. <i>Giving Directions</i> : Giving directions, commands or orders which students are expected to comply with.	9. <i>Student</i> <i>Talk-Initiation</i> : Talks initiated by students. If student is only to indicate who may talk next, observer must decide whether student wanted to talk.		
3. <i>Accepts Ideas or Students</i> : Clarifying, building, or developing ideas suggested by a student. A teacher brings more of his own ideas into play.	7. <i>Criticising or Justifying Authority</i> : Statements intended to change student behaviour from unacceptable to acceptable pattern, bawling some one out; stating why the teacher is doing what he is doing and extreme self-reference.			
4. <i>Asks Questions</i> : Asking a question about content or procedure with the intention that a student answers.				

scientific and systematic observation of teacher classroom behaviour, (ii) to identify the pattern of teacher behaviour, and (iii) to provide strategies to modify and reconstruct the concept of classroom instruction.

Assumptions :—(i) Verbal communication predominates in the classroom, (ii) verbal behaviour dominates over non-verbal behaviour and so can reasonably be coded to represent the total classroom behaviour, (iii) generally verbal behaviours tally with the non-verbal gestures of the teacher, (iv) teacher's behaviour highly affects the behaviour of the students, (v) in classroom instruction, the relationship between the teacher and the students must be kept in tact, (vi) classroom social climate highly influences classroom instruction, (vii) students interact with that teacher more who accepts their feelings and is democratic, (viii) with the help of observational techniques of teacher's classroom behaviour can be objectively observed, (ix) modification of teacher behaviour is possible through feedback, and (x) verbal behaviour of the teacher is recorded only without any consideration to non-verbal classroom behaviour with the assumption that the former is consistent with the latter.

Flander's Interaction Analysis System : Ned A. Flander (1960) of University of Minnesota developed an observational technique initially meant for measuring teacher's influence and resultant pupils' attitude and achievement. This is known as Flander's Interaction Analysis Category (FIAC) in which the total classroom interaction is sub-divided into three major headings : (i) teacher talk, (ii) student talk, and (iii) silence or confusion. A detailed account is presented in Table 3.

Coding Procedure : In FIAC two processes are involved : encoding and decoding. Encoding process is used to record events in the classroom and prepare the observation matrix. Decoding process helps in the interpretation of the observation matrix. The two processes are discussed below:

(a) *Encoding Process* : Before encoding the numerical numbers from one to ten one has to remember all the numbers and the classroom behaviour associated with those. He sits on the last bench of the classroom and assigns numbers at every three seconds intervals. The assignment of numericals is as per the teacher behaviour described in Table 3; for example, a number of 5 for lecturing, 8 for student's reply, 4 for teacher's asking questions, 2 for his praise to students, are assigned accordingly. So per minute generally 20-25 observations are coded. The inter-observer reliability is estimated by using Scott's formula.

(b) *Decoding Process* : After encoding is finished, an observation matrix is prepared consisting of 10 columns (10×10 matrix). Before making tallies in the observation matrix, category 10 is added in the beginning and at the end of the encoding categories of a record

sheet. Two continuous categories form a pair and are represented (or tallied) in the observation matrix. For example, a pair of 10-6 (10 and 6) is represented in the observation matrix by putting 10 in the row and 6 in the column. With the help of the observation matrix, one can estimate the generalized sequence of the pupil-teacher interaction. (For 10 and 6 one tally is made in the exact place or square of 10 and 6 in the matrix).

Behaviour Ratio : There are three methods of making comparisons between two or more matrices : (i) millage matrix in which all the materials are converted into common of 1000 tallies, (ii) to convert all columns totals into per cent of the matrix total and accordingly calculate the interaction ratios, and (iii) a ratio is found out based on two matrices totals and numbers in one matrix can be compared with those of another. The second method is important and generally used by researchers in which all columns and rows tallies of the matrix are converted into certain behaviour ratios. In all, fifteen behaviour ratios are found out in the FIAC. They have been mentioned below :

1. Teacher Talk (TT) = $\frac{1+2+3+4+5+6+7}{N} \times 100$
2. Indirect Teacher Talk (ITT) = $\frac{1+2+3+4}{N} \times 100$
3. Direct Teacher Talk (DTT) = $\frac{5+6+7}{N} \times 100$
4. Pupil Talk (PT) = $\frac{8+9}{N} \times 100$
5. Silence or Confusion (SC) = $\frac{10 \times 100}{N}$
6. Indirect to Direct Ratio (I/D) = $\frac{1+2+3+4}{5+6+7} \times 100$
7. Pupil Initiative Ratio (PIR) = $\frac{9 \times 100}{8+9}$
8. Teacher Response Ratio (TRR) = $\frac{1+2+3}{1+2+3+6+7} \times 100$
9. Teacher Question Ratio (TQR) = $\frac{4 \times 100}{4+5}$
10. Content Cross Ratio (CCR) = $\frac{4+5}{N} \times 100$
11. Vicious Circle (VC) = $\frac{(6-6) + (6-7) + (7-6) + (7-7)}{N} \times 100$

$$12. \text{ Pupil Steady State Ratio (PSSR)} = \frac{(8-8) + (9-9)}{8+9} \times 100$$

$$13. \text{ Instantaneous Teacher Response Ratio (TRR 89)} = \frac{(8-1) + (8-2) + (8-3) + (9-1) + (9-2) + (9-3)}{(8-1) + (8-2) + (8-3) + (8-6) + (8-7) + (9-1) + (9-2) + (9-3) + (9-6) + (9-7)} \times 100$$

$$14. \text{ Instantaneous Teacher Question Ratio (TQR 89)}$$

$$= \frac{(8-4) + (9-4)}{(8-4) + (8-5) + (9-4) + (9-5)} \times 100$$

$$15. \text{ Steady State Ratio (SSR)} = \frac{\text{SSC (Steady State Cells)}}{N} \times 100$$

[SSC = (1-1), (2-2), (3-3), (4-4), (5-5), (6-6), (7-7), (8-8), (9-9), (10-10)].

The behaviour ratios are interpreted on the basis of the norms developed in a particular country and for a particular type of teacher. Effective teachers are to possess greater values in pupil-talk, teacher response ratio, teacher question ratio, indirect teacher influence, pupil steady state ratio, and pupil initiation ratio. Teacher possessing greater values in silence or confusion, steady state ratio, direct teacher behaviour, teacher-talk, etc. are considered ineffective.

With the help of matrix table, clockwise flow analysis and box flow diagrams are prepared for qualitative and visual interpretation. It also helps in understanding the necessity to provide feedback to the teachers. Sometimes two flow charts may be compared to bring out similarities and differences in interaction.

Implications for Teacher Behaviour : (i) The teachers become conscious as to when and why provide information to students and augment student verbal participation, (ii) it helps the teacher distinguish between the proper use, of broad and narrow questioning, (iii) to either check or initiate student participation in teaching-learning process, (iv) it helps the teachers to understand pupils' ideas and feelings and to properly and timely accept those for further development and application, (v) teachers become conscious of the constructive use of the effective aspects of students' behaviour, and (vi) the student-teachers can practise and learn new and effective teaching behaviour and thereby overcome the difficulties and limitations of the traditional classroom teaching practice.

Limitations : (i) It does not describe the classroom activity in totality, (ii) it is content-free and is concerned more with social

skills of classroom management that are expressed through only verbal communication, (iii) it is costly and sometimes demands automation in collecting and analyzing raw data, (iv) it devotes more attention on direct/indirect nature of teacher's performance rather than on student talk.

With these limitations, Amidson and Hunter have brought about modifications in FIAC. The latest developments include the Equivalent Talk Categories (ETC) by Bentley and Milber, the Reciprocal Category System (RCS) by Richard Ober, IDER system by Gallo-way, etc.

(b) Simulated Teaching

Simulation as a training device originated after World War I to train the airforce pilots. It is a communication mode and a communication technology that uses a game-specific language to reach a predetermined goal. Though it gained gradual improvement in the eighteenth century, however, the sophisticated military games are of the developments of twentieth century. In military courts the soldiers engage themselves in simulating the fighting techniques to gain actual experiences of fighting in the battle-field.

Its applicability in education has been made in the last decade. In the USA, the 'National Games Council' and in Germany the 'Simulation and Games Association' were established in 1961 and 1970 respectively. Even a professional journal 'Simulation and Games' is being published quarterly since 1976. In simulated teaching (or as it is variously called : simulated social skill training, role playing, artificial teaching, etc.) a pupil teacher plays the role of a teacher, a student, and a supervisor before actual teaching in the classroom. In SSST feedback is communicated to the pupil teachers to achieve certain desired behaviour in them through artificial classroom teaching situation. Though widely used in the developed countries, its originator Cruick Shank believes in more researchers in simulated teaching and its wide applicability in the developing and less developed countries.

In SSST it is assumed that through feedback teachers behaviour can be modified through simulated practice of certain patterns of teacher behaviour for effective teaching. And, moreover, this depends upon the imitative capacity of the pupil teacher.

Steps : Ned Flanders has recommended six steps in simulated teaching techniques though there is no hierarchy of rigid steps to be followed:

- (i) Assignment of numbers or letters like A, B, C, etc., to the pupil teachers are made so that each one can get a chance in the rotation to act as actor or observer.

- (ii) Second, the skill to be practised is to be decided and prepared through proper planning.
- (iii) Third, the actions of the members at the time of simulation are 'a priori' decided upon and the person who is to be identified. The starting point as well as the time to stop the game are also communicated earlier.
- (iv) Fourth, when the game starts, the observers are to record the data for evaluation; so before it actually starts the evaluation procedure and the type of data to be recorded are decided.
- (v) The skill to be practised is introduced in a practical session and while the session is finished the sector is provided with feedback that he improves upon in the next session. The task difficulty also increases from session to session after mastering the earlier skill level.
- (vi) In the last step next skill is introduced and the earlier steps are continued once again with altogether a different actor.

Educational Games

A recent introduction to simulated teaching has been educational games in which two or three independent decision-makers act to achieve their objectives. Approximately real life situations are provided to children to fully understand human behaviour. In these games human interaction is achieved within a social structure. Educational games stress the features like cooperation, bargaining and compromise that are the human interactions in real society.

The classroom games can be helpful in raising questions and generating hypotheses, in understanding of concepts, in transfer of learning that can help in achieving mastery learning, and in developing value judgements.

In role-play games, the participants assume realistic social roles and interact each other in a common social situation. In a particular social problem situation, role play games help in learning the dynamics of human behaviour and how to respond to the problem situation.

Teacher's Role : In educational games the teacher acts as a non-directive consultant/referee. The direct role of the teacher is only permitted before and after the gaming in introducing the game and evaluating the game after it is acted upon. Teacher is to be easily available there for consultation as and when it necessitates. In the post-game discussion period the teacher makes the students understand the process and flaws of gaming and also suggests how to improve upon the game. For example, in a social studies class, to teach the enactment of a bill in the parliament (as a part of civics),

the teacher may arrange a small group such as mock assembly and let the students behave or act as members of parliament, and actively participate in the real process of interaction in passing the bill in the House that constitutes the real-life legislative process.

Advantages : (i) The students develop high motivation in learning through educational games or simulation, (ii) it leads to more and active interaction between the teacher and the students that helps increase learning in the latter, (iii) the introduction of life-game into the classroom makes the environment and process of learning natural and the students develop insights into the real-life problems, (iv) it favourably influences students' achievement and attitude, (v) it increases the decision-making capacity in the students, (vi) the role awareness is developed in the students when they play the role of others, (vii) it provides for free and interdisciplinary communication, (viii) simulation helps in bridging the gap between theory and practice, (ix) in its holistic nature it provides for Gestalt approach to learning.

Loopholes : The most important limitation of simulated teaching is that it cannot be applied in teaching all the subjects in the curriculum. Moreover, small children also cannot understand the mechanisms of simulation and are not able to participate in it. And, obviously, the teachers have to undertake heavy burden and extra work for its preparation which hardly a few can endure. Likewise, it also increases the cost of instruction in using sophisticated computers and audio-visual aids which the developing countries would be unable to afford. Last, but not least, the seriousness of learning is reduced to just a play or game and does not help in worthwhile learning.

(c) Micro-Teaching

Another most recent teaching device through feedback has been micro-teaching that originated through the doctoral work of Keith Acheson in Stanford University in 1961 and through research got a more scientific form in 1963. Allen (1966) defines micro-teaching as a 'scaled down teaching encounter in class size and class time'. Here the teaching practice or practice of a skill of teaching takes place for a short period of time and in the class of small number of student-teachers. It is a teacher education technique in which the well-defined teaching skills are acquired or practised through a well-prepared lesson plan within 5 to 10 minutes.

Teaching Skills : Teaching skills are a set of teacher behaviours that are intended to bring about desired changes in the teaching effectiveness. Micro-teaching helps in acquiring or developing teaching skills in student teachers. Fourteen teaching skills have been identified by Allen and Ryans (1969) : (1) stimulus variation, (2) set induction, (3) closure, (4) silence or non-verbal cues, (5)

skill of reinforcement, (6) asking questions, (7) probing questions, (8) divergent questioning, (9) attending behaviour, (10) illustrating, (11) lecturing, (12) higher order questioning, (13) planned repetition, and (14) communication completeness. In Indian situation, Passi (1976) has developed thirteen skills to be acquired through micro-teaching technique as : (1) writing instructional objective, (2) introducing a lesson, (3) fluency and questioning, (4) probing questions, (5) explaining, (6) illustrating with examples, (7) stimulus variation, (8) silence and non-verbal cues, (9) reinforcing student participation, (10) increasing pupil participation, (11) using black-board, (12) achieving closure, and (13) recognizing attending behaviour.

Micro-Teaching Procedure : In organizing micro-teaching certain steps are followed. Singh (1977) has presented ten steps in introducing micro-teaching in secondary teacher education in India. They are discussed as follows:

1. **Orientation** : Theoretical discussions on micro-teaching and its merits and demerits are discussed to orient student-teachers about micro-teaching.
2. **Discussion of Teaching Skills** : The teaching skills to be practised are discussed in detail. At least five teaching skills should be explained with the help of the Handbook on specific teaching skills developed by CASE, Baroda. At a time one teaching skill is discussed.
3. **Presentation of Model Lesson** : The trained-teacher then presents model lessons on the various subjects chosen by the student-teachers and at a time one skill can be used.
4. **Preparation of Micro Lesson Plan** : The student-teacher selects and prepares a micro-lesson of unit concept from his own liking subject.
5. **Micro-Teaching Setting** : In micro-teaching setting time is allotted for one session as follows: teach (6 mts), feedback (6 mts), replan (12 mts), reteach (6 mts), refeedback (6 mts). The number of other student teachers to observe the lesson is not to exceed ten, one or two supervisors are to be present to provide feedback to the student-teacher who presents the practice lesson.
6. **Simulated Condition** : Teaching lessons are presented in simulated conditions inside closed door and the fellow student teachers act as students.
7. **Practice of Teaching Skills** : A student teacher has to practise at least five skills and master those.
8. **Observation** : The college supervisor or sometimes the peers critically observe the micro-teaching presentation.

9. Feedback : In the light of the just presented lesson the student teacher is immediately provided with feedback as per the tallies and ratings on the observation schedule.
10. Teaching Time : The procedure of teach-feedback-replan-reteach-refeedback is followed and to finish one cycle for one skill takes normally 35 minutes. Likewise, time would be allotted to master at least five skills of teaching.

In actual practice teaching procedure, the trainee is made to understand the skill in behavioural terms, the demonstration of the skill on video-tape or films or even in classroom setting is made; immediately the trainee plans a short (micro) lesson to be presented, he presents the lesson to 5 to 10 peers sitting in a class which is video-taped or even audio-taped; after the lesson is finished immediate feedback is provided by the supervisor regarding the effective use of the particular skill as per which the student teacher replans and reteaches and at last on the retaught lesson by the supervisor. For the evaluation of the effectiveness of the teaching skill, the Stanford Teacher Competence Appraisal Guide (STCAG) is commonly used.

Advantages: Micro-teaching has certainly got certain improvements over the traditional method of classroom instruction. It is simple and non-threatening in the sense that only skill is presented before a peer group of 5 to 10. It is an objective feedback device to improve upon the desired modification in teachers' teaching behaviour. It provides for alternatives and more changes for immediate evaluation and additional traits. Teacher teaching through micro-teaching procedure becomes more cautious and conscious of the teaching skill, his own behaviour and behaviour of the students that increase the teaching effectiveness and so the learning. Evaluation of micro-lessons with the help of STCAG leads to more objectivity that has got unquestionable improvement over the traditional method of evaluation of model lessons. It deserves high merit in its provision for individualized training. Moreover, the mechanism of feedback in micro-teaching can be combined with SSST and interaction analysis device for more effective modification in teaching behaviour.

(d) T-Group Training

T-Group training is a feedback device to improve upon and modify teacher behaviour. In 1947, Bethal and Mine developed this feedback device in which eight to twelve trainees participate in informal, unstructured and unplanned group discussion for two to three hours to solve their own teaching problems and to diagnose the teaching difficulties. The student-teachers or even classroom teachers gather together to freely, fearlessly, and shamelessly express and exchange their difficulties faced while teaching the

students and try to find out solutions and alternative means through insight. The meeting does not require any agenda or schedule and any supervisor as such. It can take place even outside the institution. But, however, it demands an experienced trainer who helps the student-teachers to learn the insightful and logical ways of discussing their problems and finding solutions.

As a feedback device, the subject teacher arranges the teaching practice programme once or twice a week to informally discuss the problems of teaching. Through informal group discussion the student teachers realize their own mistakes and are careful in improving upon those in the next practice teaching.

Through this training programme the teacher (or student-teacher) becomes sensitive to his own feelings and others' behaviour; and through expression in a group his behaviour becomes more flexible; and develops insight into the problem and its solution. His diagnostic ability increases through it that helps him/her to be more conscious of classroom teaching and later on to solve his/her own problems of teaching without the help of his colleagues. This training device is highly used in the developed countries like the USA.

Indian Researches

Though of recent development in India, educational technology has gained ground in the various researches conducted by teacher educators and various research institutions. Most of the studies have been conducted in CASE, Baroda. A few important and relevant studies are discussed below:

Desai (1977) undertook a study with the objectives of helping the teachers perceive their own classroom behaviour, modify it, sustain it and study the effects of the modified behaviour on students' characteristics and academic achievement. He found that training in Flanders' Interaction Analysis Category System positively modified teachers' indirect behaviour; training and feedback given to the experimental group of teachers positively affected students' academic achievement. Rajiwala (1976) in a study that was undertaken with the objective of studying the effects of change in the teachers' behaviour pattern on pupils' development revealed that training in FIACS positively modified teachers' indirect behaviour and the training and feedback given to the teachers of the experimental group affected pupils' attainment, classroom trust and initiative level positively. The findings of Vasishta's (1976) study suggests that training in Flanders' verbal interaction technique significantly contributed to the attitude towards teaching, self-perception, and classroom performance of secondary science and mathematics student teachers. Teachers trained in FIACS made more use of interaction categories of acceptance of students' feelings, praise, accepting pupil ideas, pupil initiation, and less use

of categories of lecturing and giving direction. They also became more indirect in dealing with their students.

The DTE, NCERT in collaboration with CASE, Baroda, undertook a study in 1975-76 the results of which indicate that the student-teachers trained through micro-teaching technique showed higher general teaching competencies than the teachers trained through traditional teacher training programme. In another study conducted by the NCERT in collaboration with 22 institutions in 1976-77, it was found that the general teaching competence of study teachers trained through micro-teaching with perceptual modelling and those trained through micro-teaching with either symbolic or audio-modelling did not differ significantly.

Current Trends

During the last two decades, significant changes in the status and functioning of technology in education have taken place that provided a new outlook to the field. A few of these are discussed below:

(i) *Personalized System of Instruction (PSI)*: Originally known as Keller's Plan, PSI was developed in the sixties. This is an extension of the programmed instruction with larger frames and personal social orientation. This system lays more stress on practical written work. Students are provided with assignments, printed materials along with questions and subsidiary instructions about the content and order of reading. A student after mastering the materials comes to the classroom and the proctor clarifies the quizzes. Any lack or error leads to further reading of those portions of the material. The process continues till the learner masters the whole material.

The characteristics of PSI include (i) mastery of the subject as the goal, (ii) self-pacing on the part of the learner, (iii) written materials to carry exact information and the demonstrators to act as motivators and not examiners, (iv) individualized attention by the proctor, (v) switching over to next unit of materials after full mastery over the first, and (v) written word as the most teacher-student communicator.

Though PSI was initially developed to deal with psychology programmes, later on it was used in social sciences, physical sciences, science and engineering. Moreover, the single course system has been extended to sequences of courses. PSI is more justified in teaching learning process than the other approaches in a class or in a college and for individualized instruction with self-pacing.

(ii) *Continuing Education*: Education has been viewed as a life-long process to enable one to efficiently and effectively cope with

the community's world of work and leisure and to acquire vertical integration within oneself. Educational technology helps augmenting continuing education in its contribution to (i) increased literacy, (ii) numeracy, (iii) professional development, (iv) vocational development and training, and (v) personal-social aspect of human development.

(iii) *Resource-based Learning*: Resource-based learning is one of the latest developments in educational technology that is based on the principles of programmed learning. This provides the learner more responsibility in the form of material and its organization. RBL involves material production and material effectiveness (the former in terms of producing materials as per the need of the learner, and the latter in terms of the effectiveness of those materials in cognitive and affective domains).

At present, RBL takes place with the expansion of already existing school library services into audio-visual fields, and persuasion of material-producing centres to the teachers to adopt new organization for learning with a view to involving the student more and more into it. The research needs in the area include the development of management techniques for material production, and avoidance of duplication of effort which has become a common phenomenon in the schools and colleges.

Educational Technology—Indian Needs

The Indian classroom needs introduction of new educational media to cater to the needs of the socio-culturally disadvantaged first generation learners in terms of quantity and quality, and to deal with the problems of learning of the heterogeneous groups through individualized instruction and attention. For this the socio-economic needs of the learner that the technology can cater to are to be recognized; suitable materials and techniques are to be developed, trained personnel in handling the technology in education are to be prepared, and the like.

In our country, unless the traditional classroom instruction is overhauled, changed and broadbased, the socio-economic needs of disadvantaged communities would hardly be fulfilled. For this, care must be given to proper planning and administration, and to the system of education itself. Rapid technological, industrial modernization and development in our country, in future, would demand specialized skilled manpower for varied employment opportunities and world of work. To meet this demand, the traditional classroom is either to be replaced or improved upon to suit the demands of specialized skills. Though lack of finance is one of the major hurdles in our country, careful planning would lessen, if not completely eradicate, the burdens and difficulties. The initiatives taken by NCERT (Delhi), CASE (Baroda) and other institutions and the Ministry of Education and Culture

to provide education through new educational media including the INSAT-B are highly commendable.

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INTELLIGENCE : ITS NATURE, GROWTH AND MEASUREMENT

It has been seen that intelligence is integral to human nature as a whole and so it is not easily definable. But we do distinguish individuals as more or less intelligent in our everyday life. Generally speaking, 'alertness' with regard to the actual situation of life is an index of intelligence.¹ Cognitive faculties like observation, memory, imagination, conception, and reasoning are also included in the meaning of intelligence. Intelligence is a verb or adverb in meaning but it is a noun in its form. Intelligence is not a thing or object but it is a way of acting in a situation.

Definition of Intelligence

Intelligence and intellect are not one and the same thing. Intelligence is wider in meaning than intellect. Intellect means cognitive powers or activities like perceiving, observing, remembering, imagining, and thinking, but intelligence on the other hand means not only intellectual activities but also the capacity for solving practical problems of life as well. Terman has defined intelligence as ability to do abstract thinking. Colvin has defined intelligence as ability to adjust to environment. Thorndike has defined intelligence as the power of making good responses from the point of view of truth and fact. Woodworth has defined intelligence "as intellect put to use." In simple words, intelligence means intellect as is applied in practice. On the physiological side intelligence means the facility and vigour with which the nervous system can adapt itself to normal situations of life. Thus, we may say that intelligence is an indicator of the ability to cope successfully with novel situations. We may also say that intelligence is the capacity to learn. Intelligence is not a single or simple faculty, but a compound of various elements. As has been said earlier, psychologists differ among themselves in defining intelligence. But they agree in reading it as the

1. Bhattacharya, P.N., *A Textbook of Psychology*, A. Mukerjee and Co. Pvt. Ltd., Calcutta, p. 140.

ability, (i) to carry on the higher process of thinking; and (ii) to learn; (iii) to adapt oneself to a novel situation. Alfred Binet defines it this way: "To judge well, to understand properly, to reason well, these are the essential springs of intelligence." Cyril Burt says that it is the "power of readjustment to a relatively new situation." In the opinion of the author, intelligence can be defined as the versatility of adjustment.

THEORIES OF INTELLIGENCE

Before Spearman, there were three theories of intelligence: (i) Monarchic; (ii) Oligarchic; and (iii) Anarchic. Monarchic theory believes that intelligence is one unitary faculty or ability. Oligarchic theory comprises a number of big faculties like judgement, memory and imagination. The third theory i.e., Anarchic, contends that intelligence consists of many abilities which are independent of one another. Ebbinghaus defines the first as unifactor theory and calls intelligence a single function. Thurstone's primary ability theory is known as Oligarchic theory while Thorndike is in favour of the third, i.e., Anarchic, which, in other words, means also multifactor theory. According to Thorndike, intelligence is the sum total of many distinct functions. The following theoretical considerations, which fall under the theories of intelligence, provide further elaboration on the nature of intelligence.

Group Factor Theory

This theory is based on the assumption that 'g' alone cannot be attributed to a higher correlation. Spearman and his researches corroborated with the view that many intercorrelation co-efficients tend to include some correlations which are not to be associated with sheer 'g' factor simply. The additional common factor, as in tests 'g' and 'h', was given the name of a group factor, and, a theory was named after it. This factor was associated with more than 2 tests.

Many factorial psychologists have assumed the role of group factors, and it is also assumed that 'g' factor is to be presumed. Burt in U.K. and Holzinger in USA took a similar stand. They believed that methods, if used as per procedure, tend to extract 'g' besides other factors. However, the performance of tests also provides a view on the extraction of group factors.

Spearman had marked out a well-built theory on the number of factors in the group factor theory. He found that such abilities like verbal ability, numerical ability, mental speed, mechanical ability, attention and imagination were involved in this theory.

With the introduction of group testing, and, with the proposed use of diverse tests, it made one possible to reduce errors in sampling and to assess scores for correlates which could conform

themselves to a pattern which was not just hierarchical in conception strictly and then applying the group factor procedures. The whole array of co-efficients are classified and categorized, and, grouping attributed to the group factor. The relation between the results of group factor method and the general factor method is expressible by a simple transformation matrix.

The group factors are not as broad as 'g' and they do not operate in all tests. Further, they are neither narrow as are 's' nor are they limited to a simple test. They tend to operate in sets of similar tests.

Thurstone used multiple-factor analysis to discover how many factors were necessary to account for the test intercompilations. Further analysis was done to determine weights that would indicate how much of the variance of each test was associated with each group factor. Multiple-factor analyses over the years have yielded data on several more factors and intelligence was considered to be known as consisting of several important and independently varying abilities. Group factors tend to correlate positively into each other.

The procedure value of group factors has been studied from time to time. American and British psychologists have collected information on contribution of group factors to vocational psychology. However, group factor ability is better in service than just general intelligence. For the best intellectual resources, pursuit of happiness is the control of the wastage, and abilities, when harassed, provide such a theory on unhappiness.

This theory has been advocated by Thurstone and his associates. By actually participating in a large programme of testing, in which a large variety of tests were administered to college and secondary school students, Thurstone came to observe that there were statistically derived six 'primary' factors. These factors were found in sufficiently good strength as to be needed in test construction. According to this theory as advocated by Thurstone the group factor theory holds that intelligence is composed of a group of 'primary mental abilities'. Each of these abilities is relatively independent of the other. General-factor theory of intelligence is not adequate to describe intellectual functioning. The group-factor theory holds that certain mental operations that have a primary factor in common are called a 'group'. Each group of mental abilities has its own primary factor.

The factors which were found with sufficient strength to be needed in test construction were called *the number factor, verbal factor, word fluency factor, reasoning factor, and the rote-memory factor.*

Thurstone emphasised that it has not to be concluded that these factors are all the primary mental abilities. These are the ones that

were found to be sufficiently clear for general application. It has been found that the factors are positively and significantly intercorrelated. It is contended that there must be some other factors or a factor to account for the intercorrelation of the various tests designed to measure the so-called primary factors. Thurstone has suggested that in addition to the primary factors there is a second order ... 'general factor' and that 'if further studies of the primary mental abilities of children reveal this general factor it may sustain Spearman's intellectual factor.'

Thus, from the discussion on the nature and theory of intelligence, various viewpoints and explanations have been given. However, these attempts have helped in explaining the nature of intelligence systematically and in an organised manner. The tests on intelligence are mainly based on this advantage.

Multiple-Factor Theory

This theory owes its influence to the works of Spearman who, alongwith other psychologists, developed data on this theory. Application of multiple-factor analysis has provided a view on this theory and Thurstone's development of "primary mental abilities" or "factors" that formed the basis for multiple-factor theory of intelligence was a view on the growth or development on factor analysis. With factors seen as not operating pervasive enough to call general ability, intelligence came to be considered as a conglomeration of several important, independently varying abilities.

Accordingly, a view prefers to look for a plurality of group-factors rather than for a single general factor, and this view is known as the multiple-factor theory.

So, the multiple-factor theory holds that the performance on a certain test depends upon one or more common factors each weighted according to its significance for success in the task.

Burt reports that the plurality of common factors enters into most of correlation matrix, and, however, the correlation data depend upon the set of tests that are used, or, chosen. He also felt that factorists were all multiple-factorist in means and on problems.

As the performance in tests could not be completely accounted for by a single general ability, or by specific abilities, additional factors had to be brought in to explain common processes shared by the tests within a particular group but not shared with tests in other groups. It is assumed that, in essence, these factors are not, as group factors, as broad as 'g'. It is assumed by a view that 'g' does not operate in all tests as correlation between tests can be also zero, or, negative in view. And correlation can be very low as low as .10 or .20 which supports a view that influence of other factors is not absent.

On the multiple-factor theory, Burt reports as follows

regarding the theory: "The multiple-factor theorem, with a theorem based on superposed hierarchies, acknowledges that one has to reckon with the possibility, and, indeed, with the possibility of a plurality of common factors entering into most of our correlation tables. Whether the supplementary factors cover all tests, or only a group of tests, or in rare cases none at all, or, each only one, must obviously depend upon the particular set of tests we choose. But, in the broader sense, we are all multiple factorists today."

The multiple-factor theory does not necessarily assume that the primary factors are uncorrelated in the general population, although, it usually, though not necessarily, sets up an orthogonal reference for simplicity in solving the fundamental equations to get the original (arbitrary) loading.

The view is supported by the fact that the distinctions between general, group-multiple, and specific factors are formal rather than material, relative rather than fixed, as per the view of Burt.

Burt states that controversies of the kind on theory are many, but the aim is to have a better theory on intelligence. He reports that:¹

"And we may, I think, fairly conclude that all theories—the multiple-factor theory, the three-factor theory and the two-factor theory and the single factor theory—are merely special simplifications of the general theorem of four factors."

There is also rapprochement between the general factor and the multiple-factor theories of intelligence in terms of what we call "second order factor."²

Thorndike (1927) proposed an early multiple-factor theory of intelligence. As the name of theory implies, he maintained that intelligence consisted of many highly specific processes and that a good test of intelligence would sample these processes. These highly specific factors jointly would comprise intelligence. According to this theory, any intellectual activity is dependent upon a great number of these minute factors operating together. If two kinds of intellectual activities are positively related, the degree of relationship is in direct proportion to the number of common elements involved in the activities. Thorndike found that many intellectual activities depend for their functioning on common elements and for practical purposes. Some of these factors could be grouped together for purposes of measurement. Thorndike's CAVD test, designed to measure ability to deal with abstractions, has tests of sentence completion (C), arithmetic reading (A), vocabulary (V) and the following of directions (D). Though they do not measure all the factors involved, Thorndike contended that these measures of

1. Burt, *The Factors of the Mind*, Page 164

2. *ibid.*, Page 166

abstract intelligence were sufficient bases from which to estimate other aspects of abstract intelligence.

Two-Factor Theory

Among the theories of intelligence, Spearman's two-factor theory is historical in background on mental testing. This theory is as old as 1904. The logical premise behind this theory was placed on the understanding or correlations between two tests which implied a factor common to both and the role of specific factors, as many as two, at least, were conceived. Thus, a common factor, 'g', and specific factors, s_1 and s_2 etc, are expected to present the ability pattern.

A psychological design on the theory of mental abilities was based by Spearman on a conceptual view on the abilities of man. It is said that Spearman's psychology was far superior to his algebra. Spearman uses the concept of "oligarchic" doctrine of mental abilities. He viewed that such a view leads to a complex number of factors. He reported that Plato sorted between two types of abilities and one was given the name of sense and the other was called intellect, and both were required to participate in human efforts. Later, such other factors as memory, imagination and invention were introduced. A few more were added later. Such abilities, as sources of power, were exploited to protect a view on factor knowledge.

Spearman advocated that "all knowing originated in three fundamental laws with corresponding processes—the awareness of one's own experience, the education of relations and that of correlates. Each of these, again, admits of sub-classification in an exhaustive manner, so that no considerable field of cognition need to be overlooked."

The best tests of his 'g' are concerned with relations, and the relations are perceived connections between things. The things between which the relations occur are called "fundaments". He also used "education" of a relation as an explanation on products.

It is said that Spearman's conception of "education of correlates" belongs to the S category of convergent production. He had a broader conception of the term "relation" in mind than the one used in S theory. Relation and 'g' are loosely connected by him.

Spearman arrived at a number of conclusions on the nature of memory and its abilities and relativity that is associated with it. Some memory tests did not have 'g' factor and verbal and non-verbal memories and visual and auditory memories were also identified.

In brief, Spearman concluded that there was a general factor present in all said tests and that the general factor was intelligence. The amount of success achieved with any test was said to depend

upon a general factor that it shared with other tests and a specific factor which was unique to the test. The specific factor did not produce any correlation since it is uncommon. Two similar tests could have common specifics, however, depending on the quality of tests used.

Spearman (1904-1927) developed the theory that intelligence is predominantly a generalised function. He called this general factor 'G'. He held that this general function should be measured through a wide sampling of tasks essentially mental in nature. According to Spearman, all intellectual activity is dependent primarily upon the 'G' factor which is common to all so-called mental activity. This factor is possessed by all individuals but in various amounts and the amount is to be measured in the determining of intelligence. According to Spearman, all tasks do not require the same amount of this intelligence factor and, therefore, the sampling of 'G' would have to require a diversity of tasks. Spearman, by using different tests to measure intelligence, found that such tests as word meaning, sentence completion, arithmetic reasoning by analogy and perceived relationship in geometric form were positively correlated with one another. He explained the correlation, among these diverse tasks, by postulating the 'G' factor that is common to all mental activity. The extent of relationship is determined by the amount of 'G' required to perform satisfactorily the task in the different areas.

Since correlations among the various tests used were not perfect, Spearman postulated a specific factor called "S" factor, one or more of which would be involved primarily in different tasks. Thus, Spearman indicated two factors, a G factor and an S factor, the G factor being involved in all mental activities and the S factor in varying degrees in different activities. The primary and most important of the factors is the general one since it is regarded as critical for the measuring of intelligence. A sound test of intelligence would be one which sampled the G factor in various activities. The theory that all forms of mental activity have something in common has been the basis from which tests of general intelligence have grown. Tasks of different kinds have been included in tests of intelligence and psychologists have felt free to make a sum of the scores on the various tasks to give a total score that would be indicative of the individual's general level of intelligence.

The Hierarchic Theory

Before this theory on intelligence is advanced, some broad views on the nature of some of its concepts are necessary.

This theory has the origin to the procedure on inter-correlations of ability and potentially measures and, as such, its origin describes a psychological need of ordering abilities with primary and secondary factors. The hierarchic theory has a vague gullibility as,

conceptually, when placed in order, second order factors are said to remain undefined because they are based on the conditions of first order factors, and not on the tests *per se*. The hierarchy is given on the matter of loadings on the number of variables, and has a psychometric design that is differentially valid to intelligence tests and to their nomenclatures which are various and even vague.

This theory of intelligence, as per the hierarchical view, is a logical hypothesis, or, a set of principles, based on the interrelationships between items or contents, and with an empirical data. Higher and lower correlations tend to determine the function of the hierarchy. Further, in this theory of intelligence some reasonable assumptions are visualized on item and test variances in the logic of level in hierarchy. The correlation matrix defines the load and rotation would decide on factors.

Catter reports that "if one starts from a base of n_1 variables the factor at the top of that hierarchy of higher order will not usually be the same as that at the top of the hierarchy from starting with a larger but overlapping set of n_2 variables."

The hierarchy of higher orders is a conception of factor relations in factor order arrangements, or, calculations based on intercorrelations. Moreover, the principle of rotation, certainly, or uniquely determines the possibility of hierarchy, or, the arrangement among factors. Pure primary factors, and second order factors, or, residues tend to determine the pattern of structure, and, conceptually, the hierarchy is drawn on functions and loadings.

In fact, extracting of factors, as the concept, tends to influence the theory on intelligence, and, besides, the test battery also influences the properties of the hypothesis on theory of intelligence. In hierarchical theory, the discovery of factors shapes the thinking on the structure.

The theory of intelligence, based on this model, was supported and developed, among others, by Burt, Vernon and Schmid and Leiman who, together, advanced the theory by introducing algebraic identity in the construction of the models and developed factoring as per hierarchical model, and abilities tend to influence the situation on order of structure.

The lack of support to this model in the Atlantic and in American science is due to the fact that American psychologists usually are using a different model and dimensions of testing, as tests or variables, which are used differently for experimental designs.

At the top of Vernon's hierarchy is 'g' whereas he used the factors in accordance with Thomson's theories rather than Spearman's model. Major group factors have minor group factors below them. Vernon accepts factoring up to three orders as it is assumed that there are, at least, three levels of the hierarchy beyond specific

factors. Accordingly, the general factor, broad group factors and narrow group factors are a three-stage hierarchy for the psychometrician to reach. However, this is only a guide, and the complexity of matrix tends to shape dimensions in the hierarchy. These are some of the conceivable explanations on the theory of intelligence. A theory is not a dogma, and, not even an abstract notion on a mechanization of wisdom. It is an insight into the truth which is to be verified. A theory is a source to a progress on the law.

Current notions of intelligence have changed tremendously. Intelligence now cannot be defined in monolithic terms like 'general intelligence' or 'Spearman's g-factor'. There are many more specialised types of ability...verbal, numerical, mechanical, mathematical, spatial, perceptual, inductive reasoning, deductive reasoning, imagination, etc. And an individual may be quite high in one and comparatively low in the other, though all these abilities tend to correlate positively and significantly. There is some divergence of views between the British and American factor psychologists regarding the number of those abilities factors and their distinctiveness. Thurstone, Guilford and their followers in USA tend to break down the mind into a very large number of independent primary abilities, while admitting that these sometimes overlap, i.e., that there tends to emerge a general or with highly selected or homogeneous groups, e.g., university students. At that age level, due to the impact of culture, specific abilities do crystallise out of the 'general mental ability or g'. And Thurstone for his original study had taken only the university students. Whereas the British have been more concerned with representative samples of adults or with whole age groups of children. Naturally, when they are tested and correlation matrices prepared, the correlations between quite different tests tend to be so high that it seems more logical to recognise a common underlying factor or 'g' and to regard the more specialised abilities as subsidiary group-factors, which are further composed of specific factors. The lower the age of the testees or, in other words, the lesser the impact of education and training on the testees, the better the emergence of 'g' factor. The higher the age of the testees, or, the impact of education and training on the testees, the lesser the emergence of 'g' factor. But in each situation, the 'g' factor, the group factors and the s-factors (specific factors) are there. In other words, we can picture the mind as a kind of hierarchy or genealogical tree, where the 'g' factor is the most prominent component in the sense that it accounts for the greatest proportion of differences in abilities. Under 'g', abilities tend to fall in two major types or group factors, Verbal-educational factor (V:e) and Spatial-mechanical perceptual practical factors (K:m). A third statistical analysis. Since these three factors, V:e, K:m and M are relatively independent, an individual may score equally or differently on these factors. With more detailed testing, these three major

group factors can readily be broken down in more specific abilities as shown in Fig. 1. This theory has been propounded and developed by Vernon.

A Note on V:e and K:m Abilities. For the purpose of measuring intelligence of school children both verbal and performance tests have been used. On the assumption that they are the measure of one and the same ability, often the results furnished by these tests are treated as identical. Cattell, supporting the same, has combined the verbal and non-verbal tests in his well-known test of intelligence. The scores on these two tests are added up to get the composite score as an index of the individual's intelligence.

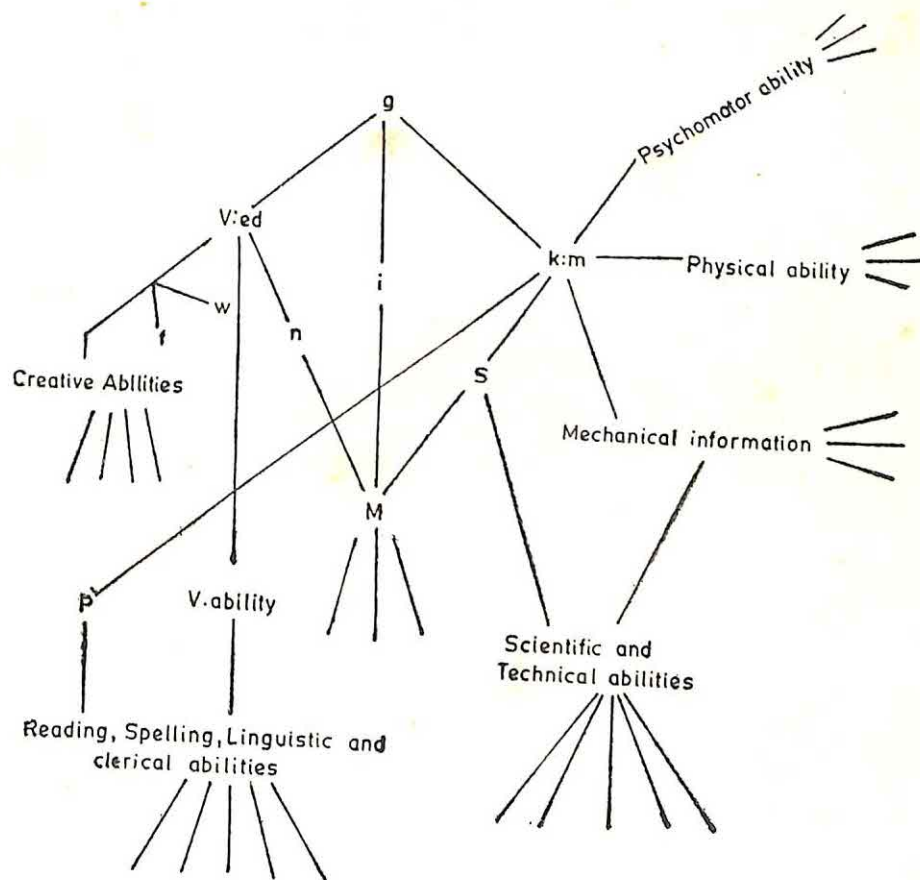


FIGURE 1

Hierarchic Structure of Intelligence (From : Dutt, *Psychological Foundations of Education*).

It is, however, difficult to justify this stand as Graw Frances (1925) found correlations of only .55 (boys) and .67 (girls) between

Binet IQ and six selected performance tests. This correlation would be ideally 1.00 if the two scores represented exactly the same ability. Perhaps Wechsler (1949, p. 5) was also quite aware of this when he stated, "The tests identified as verbal and performance differ as their labels indicate." Similar doubts have been expressed by Alexander (1935), Koussey (1935) and Thurstone (1938). These three psychologists view that these tests constructed from abstract diagrams and pictures involve spatial factors termed as 'f', 'k' and 's' by them respectively—and that all verbal intelligence tests, depending upon the manipulation of words, involve a verbal and educational factor which has been named V or V : ed factor. Quite recently Maxwell (1959) found a correlation of .10, which is virtually zero between performance and verbal scores, and concluded that they define two relatively independent factors. All these studies have been cited to support the hierarchic theory of intelligence.

Guilford's Theory on Intelligence

A major theory on the nature of intelligence is advocated by Guilford who approaches the status of intelligence and its nature in a different way. He organizes the various primary mental abilities into three or into a three-dimensional axis. One dimension on abilities is explained into 5 major categories based on processes or operations like cognition, memory, diversent thinking, conversent thinking and evaluation.

The second dimension involves content which has categories, namely, figural, symbolic, semantic, and behavioural.

The third dimension is called products having six categories, namely, units, classes, relations, systems, transformations and implications.

Each of the above constructs is given a specific meaning and reference. For a detailed study, please refer to Guilford's SI model described in his book entitled, *The Nature of Human Intelligence*.

Three dimensions include 120 cells. The example on the diagram explains the particular position of each cell and the respective interaction that 3 dimensional cells have.

The cubical model, developed on the structure of intelligence, or, intellect, presents the unique picture on abilities which are sufficiently distinct and were studied with the help of factor analysis studies. The discovery of the components of intelligence was seen by means of the experimental application of the method of factor analysis.

Table 1 gives the picture on the cognitive factor (matrix) in the structure of intellect.

TABLE 1

Matrix of the Cognition Factors (C) Connotted in the Structure of Intellect

CONTENT								
Figural (F)		Symbolic (S)		Semantic (M)		Behavioral (B)		
CFU-V 3, 14	N	CSU-V 14	S	CMU 2, 0, 6, 7, 9	N	CBU 14	2	Units (U)
CFU-A	1	CSU-A	2	10, 11, 13, 14				
CFC 14	S	CSC 13	S	CMC	S	CBC	1	Classes (C)
CFR 1, 3, 4	S	CSR 14	S	CMR 3	S	CBR	1	Relations (R)
CFS-V 3, 4, 7, 9, 14	N	CSS 14	S	CMS 4, 6, 13, 14	N	CBS	1	Systems (S)
CFS-K	S							
CFS-A	1							
CFT 4, 13, 14	N	CST	1	CMT	S	CBT	1	Transformations (T)
CFI 4, 13	S	CSI 14	S	CMI 14	S	CBI	1	Implications (I)

Note : This Table is reproduced from the original Source. Refer to the SI Model.

Following are the observations drawn from the above table:

- Each row gives a triad of abilities, having a single kind of product in common.
- Street Gestalt completion Test, etc., is a good test of figural units.
- Symbolic units are measured by Disemvowelled words and scrambled words.
- Vocabulary test cognizes semantic units.
- Regarding the ability to cognize behavioural units, tests that were used in the Aptitudes Research Project at the University of Southern California were various and were used to illustrate certain points and information. Tests like Gestalt perception Test, Letter tests of Thurstone, Word Recognition Test, Code Tests, Mask tests, Word Substitution Test etc. were used.

As each cell is an information on an ability, and serves a unit on corresponding test content, student is advised to read Guilford's basic book on the SI model for better understanding. Study of tables, however, can inform on cells and the ability matrix that they involve. It is not possible to go into details. A few facts on tests, however, are reported wherever possible which is to help students to know the type of items that were used to assess abilities.

Table 2 provides information on the matrix of the memory factors in the structure of intelligence.

TABLE 2

Details on the Memory Factors in the Structure of Intellect

Figural (F)		Symbolic (S)		Semantic (M)		Behavioral (B)		
MFU	S	MSU	1	MMU 13	2	MBU	0	Units (U)
MFC	0	MSC	1	MMC	1	MBC	0	Classes (C)
MFR	0	MSR	1	MMR	1	MBR	0	Relations (R)
MFS-V	3 6	MSS	1	MMS	2	MBS	0	Systems (S)
MFS-A	2							
MFT	0	MST	1	MMT	1	MBT	0	Transformations (T)
MFI	0	MSI	S	MMI	1	MBI	0	Implications (I)

This Table is reproduced from the original source from Guilford

Guilford reports that the area of memory abilities would not be entirely explored and only seven of the potential cells of the memory matrix had known factors in them. Blank rows in the memory matrix are to be explored. Research on memory abilities is still in progress. SI model has its own individual stand on the factors on memory.

Among several findings on memory abstracts, cognitive abilities and memory abilities are quite separable.

The distinction between memory abilities and production abilities refer to mean that retention and retrieval of information are different operations.

Factorial nature of 2 well known tests namely memory span

tests and numerical operations tests has been studied. Both have substantial specific components as per Guilford's findings.

Spearman recognized verbal and non-verbal memory as separate and for visual and auditory information, separate memory abilities were isolated by him.

For studying memory abilities, separate tests were used to study MFU, MSU, MMU, MSC, MSR, etc.*

The findings of quite a number of memory abilities, as forecast by the SI model accepts a special operation class for memory.

No investigation has yet been made regarding behavioural memory abilities as is clarified by Guilford. But in other content areas, such abilities are likely to be experienced as per research views.

By way of several reasons, it is seen that it is very difficult to control memory tests in terms on content, or to apply controls experimentally. Such difficulties lead factor analysis studies very hard to organise. It was the experience of Guilford too on isolation of some memory factors.

Table 3 gives the information on the matrix of the production divergent factors in the structure of intellect.

TABLE 3
The Divergent-Production Factors (D) in the Structure of Intellect

Figural (F)		Symbolic (S)		Semantic (M)		Behavioural (B)		
DFU 14	2	DSU 13, 14	N	DMU 6, 10, 13, 14	N	DBU	0	Units (U)
DFC 14	1	DSC 14	S	DMC 11, 12, 14	N	DBC	0	Classes (C)
DFR 14	0	DSR 14	S	DMR 11, 12, 14	S	DBR	0	Relations (R)
DFS 14	2	DSS 14	S	DMS 6, 13, 14	S	DBS	0	Systems (S)
DFT 14	S	DST	0	DMT 11, 12, 14	N	DBT	0	Transformations (T)
DFI 11, 14	S	DSI 14	2	DMI 11, 12, 14	S	DBI	0	Implications (I)

This table is reproduced from Guilford's work.

* Please refer to Table II on symbols like MFU, MSU etc.

To clarify the view held by Guilford, he substituted the term 'thinking' by the term 'production' in order to avoid the ambiguity and to understand the abilities as they would realise in tests. Tests, used in examining these factors i.e., divergent-production were word fluency tests such as the king test and the Thurstone's PMA test 'g' word fluency. Guilford had found that the elderly subjects were relatively slower in the fluency test, and, this slow behaviour was reported to create interference in recall.

Interference is also attributed to confusion of information. Elderly subjects had shown less flexibility as they tend to slip into wrong concentration, and classes.

Among some measures decoration is an effective measure, according to Guilford, and to the factor of divergent production and to figural implication. Moreover, originality and ingenuity are also hypothesized or suggested as factors. Elaboration as an ability is also attributed to this area.

The diverge production ability systems involve moreover figural systems (DFS), symbolic system (DSS) semantic systems (DMS). Divergent production of transformation involve Figural transformations (DFT) and semantic transformations (DMT). Divergent product of implications involve figural implications (DFI), symbolic implications (DSI), semantic elaboration (DMI).

Guilford reports that divergent-production abilities represent various new classes of intellectual resources and are associated with creativity and its potential. The knowledge on potential, as referred to in this system, tends to clarify the question of construct validity.

Divergent-production factors, contends Guilford, are relatively independent of cognition factors as cognitive factors are related to I.Q. The relationship between I.Q. and divergent production factors is said to be low.

To sum up, the conception of divergent-production abilities came about through the verification of certain hypothesis related to relevant abilities associated with creative product.

Table IV gives details on the matrix of the convergent-production factors (N) represented in the structure of intellect.

Very little is known about the operation category of convergent production in the realm of intelligence. According to Guilford, only 13 abilities out of 24 have been investigated. It is the area of logical deduction.

Convergent-production of units includes semantic units (NMU), Figural classes (NFC) and Semantic classes (NMC). Convergent-production of relations refers to symbolic relations (NSR) and semantic relations (NMR). Convergent-production of systems involve

TABLE 4

The Convergent-Production Factors (N) in the Structure of Intellect

Figural (F)		Symbolic (S)		Semantic (M)		Behavioral (B)		
NFU	0	NSU	0	NMU 6	S	NBU	0	(U)
NFC	0	NSC	1	NMC	2	NBC	0	(C)
NFR	0	NSR 14	S	NMR	S	NBR	0	(R)
NFS	0	NSS 14	S	NMS 6	S	NBS	0	(S)
NFT	5	NST 14	S	NMT	S	NBT	0	(T)
NFI	0	NSI	S	NMI 14	S	NBI	0	(I)

This Table is reproduced from Guilford.

U, C, R, S, T, and I refer to product categories.

symbolic systems (NSS) and semantic systems (NMS). In this model, convergent-production of transformations include figural transformations (NFT), symbolic transformations (NST) and semantic transformations (NMT).

Further, convergent production of implications involve symbolic implications (NSI) and semantic implications (NMI).

The tests used to verify the hypothesis on various constructs may be studied from the *Nature of Human Intelligence* written by Guilford. Attributes of items and logical assumptions on abilities are complex views on the functions of intelligence, and, in this section, it is not possible to exhaust the literature but, psychologically and educationally, the constructs and abilities and areas are very much informative to know on criterional requirements.

Table V gives information on the matrix of the evaluation factors (E) in the structure of intellect model. From the criteria it is seen that evaluation is defined, as per Guilford, as a process of

TABLE 5

The Evaluation Factors (E) in the Structure—of Intellect Model

Figural (F)		Symbolic (S)		Semantic (M)		Behavioural (B)		
EFU	N 2, 4, 6, 13, 14	ESU	S 14	EMU	S 13	EBU	0	(U)
EFC	0	ESC	1	EMC	1	EBC	0	(C)
EFR	0	ESR	S	EMR	S 14	EBR	0	(R)
EFS	0	ESS	1	EMS	S	FBS	0	(S)
EFT	0	EST	1	EMT	1	EBT	0	(T)
EFI	0	ESI	2	EMI	5	EBI	0	(I)

This Table is reproduced from Guilford's work. Symbols like V, C, R, S, T and I represent product categories.

comparing a product of information with known information according to logical criteria, and making, besides, a decision concerning criterion satisfactory.

According to the conception, figural units (EFU) have been found to apply to young children. EFU speed of identification and spatial orientation I and II are appellation of perceptual speed.

The factor EFU has been identified in analysis at mental age of 6, 4, and even 2 years in tests very much like those used with adults as per view from Guilford.

The factor symbolic units (FSU) employs tests like letters and words and symbolic identities and which are alike to clerical aptitude. Pains of names, letters and numbers are to be compared.

The semantic units (EMU) was modelled after a good type of tools like 'Double Descriptions Test and ideational fluency test.

In the evaluation of classes, emphasis is given to devotative and not to connotative aspects. The symbolic classes (ESC) is assessed for abilities of a subject to judge a class and its order.

The semantic classes were studied with the help of tests namely 'Class Name Selection' and 'Best Word Class'.

In evaluation of relations, criteria like identity and consistency are observed. Symbolic relations (ESR) were studied from symbol manipulation test etc.

Semantic relations (EMR) are also attributed to evaluative abilities and are studied with the help of Matched Verbal Relations.

Evaluation of systems involve symbolic systems (ESS) and semantic systems (EMS).

Evaluation of transformations include symbolic transformations (EST) and semantic transformations (EMT).

Evaluation of implications include symbolic implication (ESI) and semantic implications (EMI).

According to Guilford's classifications, evaluations tests are like divergent or convergent production abilities, and suitably to be fitted into a certain criteria of goodness.

Evaluative abilities were found to be measurable with either absolute judgement of the yes-no or disjuncture type or 'which is best' type belonging to relative judgement type.

Criteria like identity, consistency and similarity were seen as precise ones to study evaluative abilities.

For details on tests, designed to assess each of the above ability category, the student may consult the source book with advantage for awareness and understanding.

Structure of Intellect, briefly, written thus as, 'SI' is a model of intellect activity that was produced as a result of factor analytic research conducted by J.P. Guilford and his associates in the Psychological Laboratory, at the University of Southern California in U.S.A. The method followed in this factor analytic work was a growth of Guilford's extensive work following that of Thurstone. The details of these methods and the rationale of the research procedures were systematically published in the "Reports from the Psychological Laboratory". The fundamental ideas on which the SI theory stands were formulated earlier in the 'fifties and have since been developed further. The model as it stands now has been given the latest touch in 1966.

We see in Fig. 2 that at present the maximum number of factors can be $6 \times 5 \times 4 = 120$. Each has a trigram symbol, e.g., DFU means 'Divergent-Figural-Unit' factor. Customarily, the first part is taken from Operation, the second from Contents, and the third from Product. Thus all the 120 factors can be named as DFC, NST etc. Though some of the factors have not yet been identified practically, their properties can be written in advance as the behaviour of

GUILFORD'S MODEL ON INTELLIGENCE

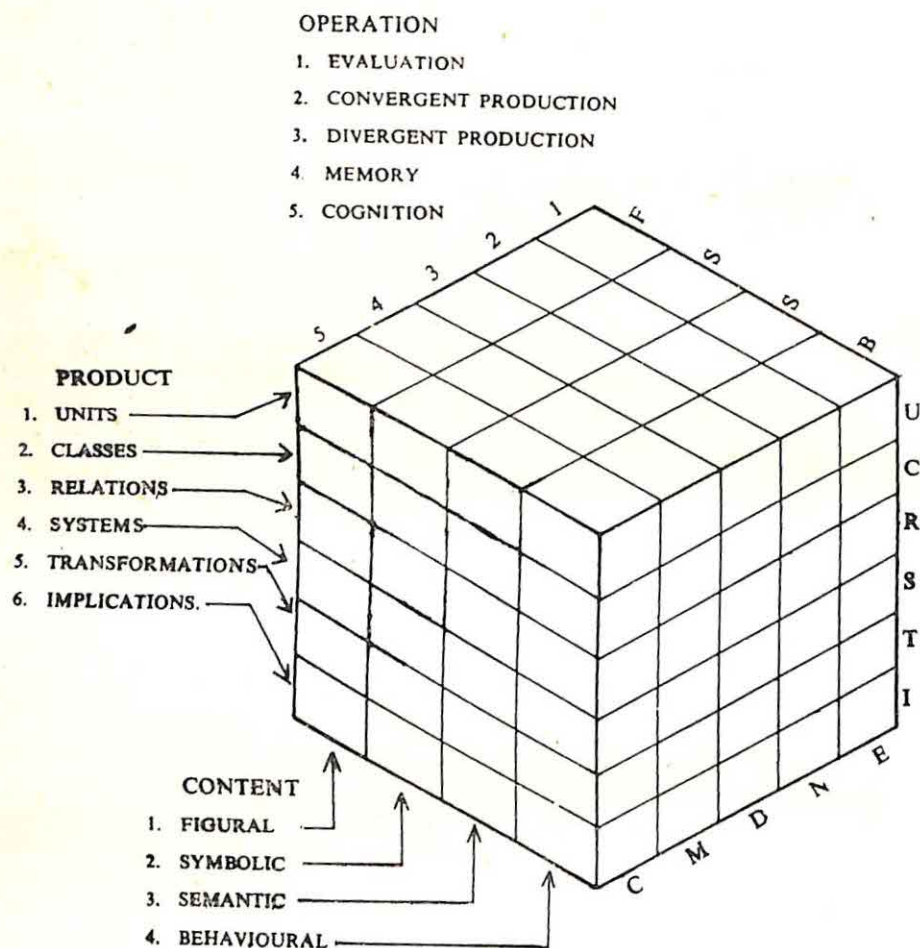


FIGURE 2

The Structure of Intellect Model by Guilford

certain elements on the Mendeleef's table could be predicted much before that particular item was discovered. When Mendeleef's table was prepared first, much less number of elements was known. So is the case with SI model. These factors are well-defined and specific. We also know how these factors will be inter-correlated, each along its parametric axis. Later factor analysis has strengthened these postulates by establishing these factors.

Educational Significance of the SI Model—Dutt says that this is the most comprehensive model taking into consideration all possible aspects of intellectual activity. This is the only theory which considers creativity (Divergent Production or thinking) along with intelligence (Convergent production or thinking) in the same model. At least there are two very significant educational implications of it:

(1) In the present world, the body of knowledge is expanding very fast, forcing specialisation even at the earlier stages of the educative process. We know already that special aspects of intellectual activity are involved in the different specialisation processes, both academic and professional. We, therefore, need as an *a priori* knowledge about the specific ability of each student to place him in the right line of specialisation. SI model and analysis of the individual under its guidance can just pinpoint the individual's abilities and provide us a secure base on which his future learning is to be based. This sounds like the theory of "Perfect Niche" in educational and vocational guidance where square pegs are placed in square holes. Probably the fundamental human creativity and freedom will elude it, but surely this is so far the most scientific step as compared to previous attempts. We are aware that the theory of 'human multipotentiality' is also there where an individual may be capable of a group of jobs or activities, rather than a 'unilinear occupation', but in that case his attainment on the various tests constructed on SI model should show corresponding results. After all the day psychology ceases to attempt to predict human behaviour it will cease to be a science. Of course there are no such studies which can establish the empirical predictive validity of SI Model. This can be carried out by testing young students on SI Model Tests. Predicting their future success on certain abilities, putting them on those trainings or educational streams and finally evaluating whether they come up to the expectations as held out by the test battery. It is very desirable if a control group is also studied along with.

(2) When some students with adequate intelligence fail to learn, corrective learning (also known as cognitive theory) in that case first requires an accurate measure of his abilities, and some concrete steps for utilising his strengths and developing him where he is weak. Merely a knowledge of IQ here is of little use. Only assessment made by SI Model tests can provide here an academically acceptable method of dealing with the problem. This can be a great diagnostic use of this theory.

SI Theory from Different Viewpoints : Dutt says that we can also look into the SI theory from at least three different viewpoints: developmental, genetic and clinical. As we shall see, these viewpoints validate this theory.

(1) *Developmental View*—Environmental pressure appears to be the main source of development along the lines of factor abilities.

This is because environment can present information to us along the lines of 24 epistemological categories of SI Model. The Piagetian view of intellectual development is in perfect accord with this SI theory. Piaget emphasised that development is in terms of acquiring information and his description of the details of development fits in with the scheme of SI concepts.

(2) *Genetic View*—The very nature of heredity demands a multi-trait approach which SI multi-variate view of intelligence provides. This “informational transmission” conception related to heredity and brain functioning finds an astonishing parallel in the informational conceptions of mental functioning provided by SI theory.

(3) *Clinical View*—Clinical studies in special symptoms appearing with organic brain damage show that they have striking parallels with the loss of SI factorial abilities. Many clinical symptoms come very close to describing SI factors of intelligence (Dutt : 1974).*

PIAGET'S MODEL OR THEORY ON INTELLIGENCE

A. Introduction

A theory of intelligence, as developed by Piaget, has a wide meaning and his work is of consequence in terms of qualitative descriptions of the developments of certain aspects of intelligence, particularly, in the human child. From what Garret's theory pleads on the nature of intelligence, Piaget's view tends to emphasize on equal concept on the growth of mind during the early period's of one's development. His general theory of development and theory of intelligence are hypotheses, based on expirical data but, however, hypotheses are epistemological in attempt to relate 'things' to concept of intelligence.

In order to understand the theory of intelligence, as advocated by Piaget, it generally or usually follows some basic constructs like “schemes”, “equilibration”, “growth of class concepts” etc., to follow development of quantitative relations, conception of quality development of number of concepts, formation of conception of space. Further, views on social cognition and formal operations tend to throw light on the basis of reasoning and errors that creep into deduction if certain problems and emphasis on products are not suitably understood to avoid their interference on judgements and conclusions. The student is asked to read Piaget from the source book to enable him to follow the developmental themes given by Piaget on child's growth including his mental and social developments. The gist of less work on conception of intelligence is nevertheless provided below:

Piaget's basic approach is to quantify descriptions on the intellectual development, and to influence psychometrician to emphasise

* N.K. Dutt, *Psychological Foundation of Education*, Doaba House, Delhi, pp. 146-53.

a view on intelligence. Basically, he was a genetic in view, and eventually age and social norms on growth were studied for use of special tests. The growth studies of Piaget and his associates have accelerated a view on the nature of differentiation and generalization on the intellectual factor. The unique position of his theory is the idea of how children tend to evolve their minds from mental activities and from such concepts as the class of emphasis based on categories of abilities etc. The nature of intelligence and theory on it is a logical, theoretical, epistemologic and genetic evidence on the conception of intelligence.

B. Piaget's view on Intelligence and A Theory on Mental Development.

Piaget's contribution in understanding nature of intelligence is helpful to the scientific world and also to the students of psychology who are interested in children's development. Studies of development of intelligence of children owe a long study view to Piaget's studies which have shaped a psychological theory on the developmental knowledge on intelligence as well. His persistent devotion to the kind of studies on children's intellectual growth has given fresh and broader understanding on education and on Posterization of minds in children. His work is considered very useful in terms of knowledge regarding the experiences which tends to shape or develop particular knowledge on the growth and development of intellectual behaviour and its theory at young and adolescent stages later.

Piaget's background and interest are generally biological in view and as a biologist, he served taxonomical influences that were imparted to child and adolescent psychology by introducing several genetic conceptions. The constructs on intelligence are essentially developmental in information and activity-centred intellectually. In his theory, some basic views are logical in form. As a psychologist, he tried to understand and examine a child clinically with a study to probe behaviour from a deeper process alongwith philosophical and logical processes to enable teachers and parents to know what, why and how of growth in child's life takes place particularly as intellectually.

Piaget's understanding on behaviour of children were based on natural and objective milieu and both the formal and informal situations were employed by him to study basis of intellectual development. It is concluded that his insights and observations on children were deep and valuable and his convictions on pupils not superficial due to acute observations on field data.

Piaget attributes mental awareness on the things and objects to developmental quality in which imitation and adopting the behaviour of others is taken as due to psychic qualities. An intelligence theory, as developed by him has basic qualities and it enables

the child to understand the meaning on self-judgements on which prestige is given a lot. Performance and self-criticism are taken as part of mental attributes, and even competition, or, awareness on it, is considered a mental discovery and a recognition.

Intellectual concept is taken by Piaget as a standard of one's modes, manners, adaptations, customs and folk-talks—which are all parts of mental culture. In this process of mental development both mental horizon, and moral behaviour are taken as an index of mental quality. It is accompanied on important primary values on truthfulness, honesty, and right demeanour—which are taken as the aspects of moral education. And right and wrong views are accepted by Piaget as function of mental concepts and right and wrong are called as learned behaviour which is the conscience of the intellectual mind. The general view of intelligence by Piaget are elaborate and are even functional. He introduces three aspects to explain intelligence and its behaviour. They are:

- (i) Content which refers to manifest behaviour.
- (ii) Function which includes intellectual activity basically and is related to development.
- (iii) Structure which is connoted by scientific information or views on the essential and basic thought on knowledge regarding pupils through involvement and activity.

Such views are the basic frames of a theory on intelligence. Piaget's work is, however, characterized by following attributes which are principal to his unique system of thought and are not equal to other concepts. It is so because:

- (i) It is generally direct observational in nature, and is not considered psychometric, or, statistical or quantitative in significance exclusively or rigidly.
- (ii) It is basic on intellectual development and growth while, at times, approval is on the theory of knowledge and its development, and
- (iii) It is information as well as for operations and its links are even with other theories as well as like with Guilford or Thorndike on some similarities.

The impact of Piaget's work has functionally influenced some of the views of the psychometric psychologists, while, his approach basically is not to rely merely on statistical or psychometric concepts exclusively in the study of intelligence as have been attempted by psychometrician or factor analysts.

Further, the type of approach by Piaget on studying intelligence, or, developing concepts on mental abilities are epistemological in

the same that they seek to orient the concept round a theory and the theory is directed to foster knowledge and concepts that are based round a generality.

Like Binet, Piaget has drawn conceptual matrix for various age groups chronologically, and various investigations were carried out to develop constructs like "classes", "relations", "quantity", "number", "conservation of quantity" and "space".

The relations between concepts or constructs are based on natural order rather than on any statistical intercorrelations. However, constructs used or developed by Piaget are found to be experimentally or factorially validated by Guilford etc.

It is Piaget's view that his theory on intelligence is developmental. Child's intellectual limitations may develop even egocentricity in the thought processes and he may show inability to analyse his own thought processes and check on the conclusions he draws which is a mental dysfunctioning. Socialized speech, or thought level is considered mental in disposition and associated with (i) adaptative information (ii) criticism (iii) commands and requests (iv) questions and answers etc. They are part of child's mental development and are essential to rural adjustment and mental personality of the child. The theory of intelligence is, thus, biological and genetic in view.

C. Seriation As a View

The idea behind Piaget's view on intelligence is built round the concept of seriation which is somewhat related to relation-cognition abilities and items of information of a certain context category in serial order presented. Information is to be connected through a relation and observations based on definite order conceived. Moreover, the concepts are classified into productive mental structure on memory for products as are viewed by Guilford* who has reported the following features of the model of intelligence and even a way to analyse the nature of intelligence as per Piaget's approach :

- (a) It has logical aspects of classes, on mental ability which are used to theorize about classes on intelligence.
- (b) It employs seriation as the possible relation but emphasizes that seriation is not the only instance of relations.
- (c) It considers adult thinking unformalized in logical terms while mathematical thinking is formalized.
- (d) It uses some activity to put things in order.

* Guilford, J.P., *The Nature of Human Intelligence*, p. 213.

Mental or intellectual life is attributed to quality of concepts. According to Hurlock, mentally, children have to pass through the four successive stages on the animistic concepts namely conscious (between 4 to 6 years), rotative conscious when things are moving (between 6 to 7 years), movements of view within and without the consciousness like sun and bicycles respectively and plant-animal consciousness when animals and plants are felt and recognized.

Whole mental set cannot be set aside from general theory of development. Piaget has mapped the entire view of human intelligence in terms of:

- (i) Content which is considered as observed data.
- (ii) Functions which is considered as principles of activity,
- (iii) Structure which is associated with knowledge.

He has given primary attention to information and operations and both are classified as concrete and another even as formal. Such concepts like groupings, implications and transformations are also used in the general theory of development of intelligence.

In the theory of development, culturally, theory emphasizes concepts like space, time, quantity, conservation, number, etc, which are used clinically and cultural stimulation is considered as basic requirement for intellectual development.

Development of intelligence is determined by growth of information, assimilation and accommodation and are biological in basis. Space learning is also recognised as part of child's mental growth.

Intellectual development has periods like (i) sensori motor intelligence, (ii) concrete operations, (iii) logical thinking etc. Details are given in the next paragraphs. Growth in class concepts and development of quantitative relations are also attributed to self-growth. Moreover, development of conceptions of quality and of number and concepts are generally considered important for adult conceptions are active and having life, and related to intellect-object and to animate inanimate definiteness.

Guilford highlights that Piaget has emphasised the following 3 categories of abilities:

- (i) Units dealing with semantic concepts
- (ii) classes and
- (iii) relations.

Piaget recognizes product of information as important and

considers that information and knowledge, as one had from the children of different stages, are the levels of mental development. Logical operations and thinking are also used to explain mental development.

The adolescent stage is considered as phase when abstract mind is shaped to think at the theoretical level.

It is seen that some conceptual developments of Piaget's model and SI model fit with each other and picture of intellectual development of Piaget is in accord with Guilford Model particularly in terms of information concepts. Origin of intelligence is, thus, a biological, logical and physical view on mental growth, and, the abstract development is explained in higher development of mind in terms of using higher and complex symbolic thinking to induce development.

Piaget has developed an elaborate theory on thinking which is explained below:

MEASUREMENT OF INTELLIGENCE

Can Intelligence be Measured ?

The ultimate nature of intelligence has a theoretical faculty and cannot be measured. Intelligence tests do not measure intellectual capacities directly nor it can be seen, felt or heard. They measure, on the other hand (the manifestation of intellectual capacity) in action or in behaviour. It is believed that every human action has some intelligence behind it, not expecting even that of the lowest idiot. The form of intelligence correspond to those of behaviour.

The level of intelligence an individual has is measured by (1) the difficulty or the task he can perform; (2) the range or worth of action he can do so; (3) the speed with which he can do or does; and (4) to quote Sandiford, 'the harder the task a person can perform the greater is his intelligence'. Secondly, the more tasks that an individual can do, the more intelligence he has and thirdly, the quicker the responses of an individual to the given task, the greater is his intelligence.²

History of Measurement of Intelligence

The most important problem in intelligence is its measurement. This has led to the emergence of a new branch of psychology which is known as test psychology. In the 19th century Gall used to measure intelligence by studying the prominent part of the brain. He

2. Bhattacharya, P.N., *A Textbook of Psychology*, A. Mukerjee and Co., Pvt. Ltd., Calcutta, p. 144.

was a psychologist, but such measurements suffer from the personal equation of the psychologist. New types of intelligence test in psychology aim at devising objective test and measurement of intelligence. Sir Francis Galton in his 'Hereditary Genius' called attention to the scientific investigation of intelligence measurement. He showed different levels of intelligence from the genius to the idiot in the normal distribution curve," diagram of which is given below.

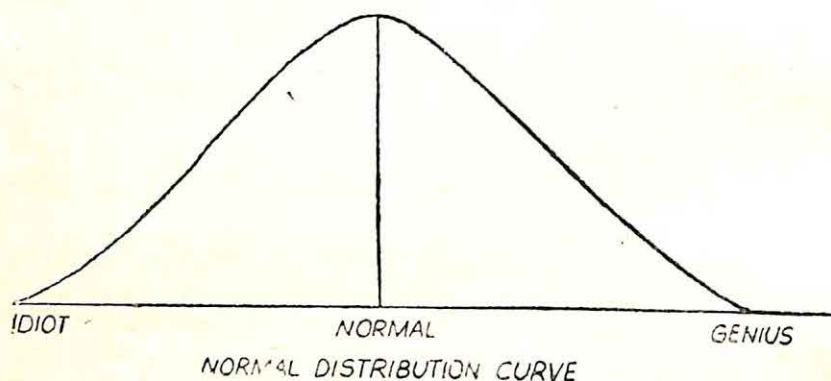


FIGURE 3

The two things we may call extremes of this curve are occupied by the genius and the idiot. The number of genius as well as the idiot is the smallest. At the mid point of it are situated individuals of normal intelligence who out-number the former (genius as well as idiot).

The great German psychologist whose name was Ebbinghaus, prepared the ground for the measurement of intelligence in his completion test, but it was Alfred Binet, who revolutionised the measurement of intelligence. In Paris educational authorities, while anxious about the backwardness of many pupils at the local Municipal School, entrusted Binet with the charge of finding out the reasons of this backwardness. He came to the conclusion that the intelligence of a normal child develops without school education and prepared a number of simple tests meant for measuring the intelligence of children of each age level and applied these to them. Thus he succeeded in the standardisation of his tests. What do we mean by standardisation? The standardisation of test is to ascertain the age level for which it is suited. Every child of a particular age level passes the test for which it is meant, nor does he necessarily fail in the test standardisation for higher age level. For example, a four-year-old child may not pass all the tests standardisation for his age level. Another child of this age may pass tests only and not those standardisation for higher age level. Here again another five-year child may pass not only his test, but also some

or all of those standardised for a higher age level. Thus Alfred Binet discovered three groups of testees and on the basis of his findings he divided the age of the testees into chronological age or physical age, and mental age. Chronological age or physical age is measured from the testee's date of birth and the second, i.e., the mental age is measured from the standpoint of his mental abbreviation form of chronological age is C.A. and that of mental age is M.A. In simple words M.A. indicates that the child has reached a point of intellectual development comparable to that of the child of the equal age group and C.A. refers to the actual age since birth. The following contributions are to the credit of Alfred Binet.

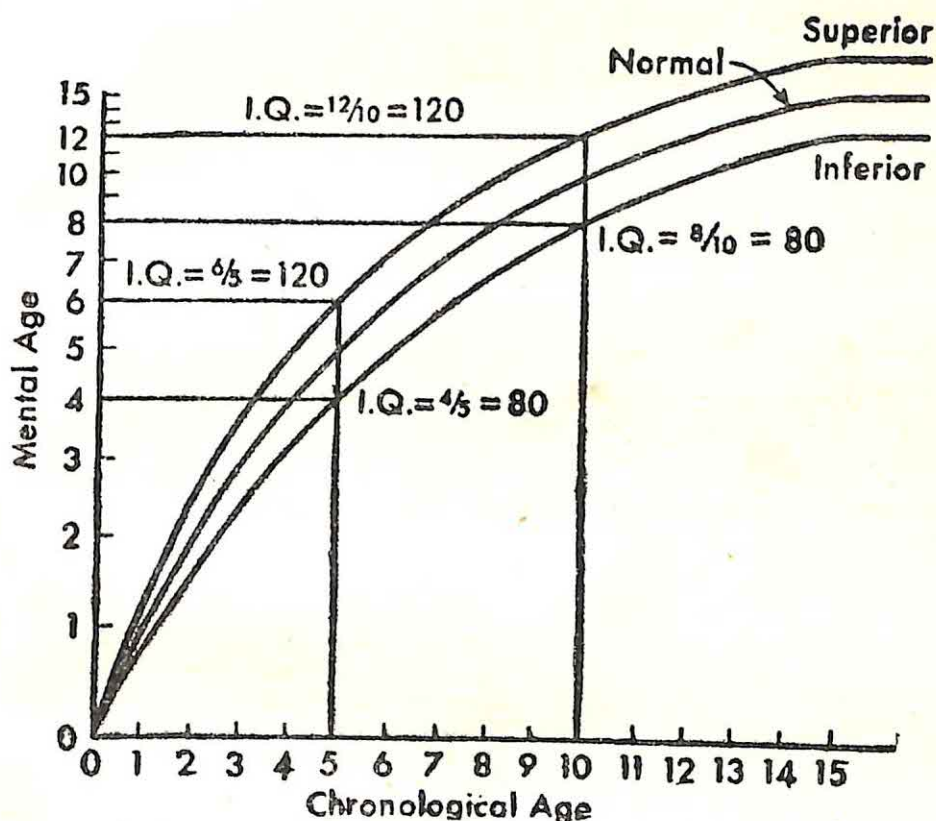


FIGURE 1

Hypothetical Growth Curves which give a constant I.Q.

1. He devised different tests for the measurement of intelligence for various groups and age level;
2. He standardised these tests; and
3. He distinguished between chronological age and mental age

and lastly (which is the most important contribution) he found the intelligence quotient based on the ratio of two kinds of age level.

Meaning of I.Q.

I.Q. is a ratio between mental age and chronological age, multiplied by 100.

$$\text{I.Q.} = \frac{\text{M.A.}}{\text{C.A.}} \times 100$$

A child with a mental age of six and a chronological age of five would have an IQ of 120. A ten year's child with an M.A.

of 5 years would have an I.Q. of $\frac{5}{10} \times 100$ or I.Q. = 50

The I.Q. indicates the rate of mental growth of a child. It expresses size of the yearly increments that are made to a child's mental level. By indicating the rate of mental growth, the I.A. may also be regarded as an index of brightness. Children may have same I.Q. but have different C.A.'s or may have same M.A. but different I.Q.'s. (see Fig. 4)

Classification of Intelligence

Various attempts have been made to classify intelligence according to the I.Q. Some of the attempts are given on the following page.

Terman's Classification of Intelligence by I.Q. Levels

<i>I.Q.</i>	<i>Classification</i>
Above 140	Near genius or genius
120-140	Very superior intelligence
110-120	Superior intelligence
90-110	Normal or average intelligence
80- 90	Dullness
70- 80	Border line
Below 70	Definite feeble-mindedness

Idiot possesses I.Q. between 20-25, his mental age not exceeding 5. The M.A. of the Imbecile again is about 8 and his I.Q. varies from 25 to 50. Thirdly, the Moron is only 11 in M.A. and from 50 to 70 in I.Q. The idiot resembles the ass in intelligence.⁴ Left to himself, he is not capable of carrying on even the elementary functions of self-preservation, like feeding, dressing and bathing himself

4. *ibid.*, p. 147,

Wechsler's Classification of Intelligence According to I.Q.

<i>I.Q. Limits</i>	<i>Classification</i>
128 and over	Very Superior
120 to 127	Superior
111 to 119	Bright Normal
91 to 100	Normal
80 to 90	Dull Normal
66 to 79	Border Line
66 and below	Defective

and avoiding the common danger of life. The Imbecile can be taught the above functions, though he cannot be taught to read and write and the higher processes of thinking. The Moron can by training and education, learn to read and write. The dull can rise up to the level of a graduate by dint of hard work and perseverance. The normal can carry on all intelligence functions. The bright and the very bright can do intelligence work with greater ease and facilities. The Genius and the extra-Genius show originality and creativity in every intelligent work that they do.

DISTRIBUTION OF I.Q. ON THE BASIS OF PERCENTAGE

There is difference of opinion among test psychologists with regard to the distribution of I.Q. on the basis of percentage. The following is the distribution of the I.Q. on the basis of percentage given by Terman.

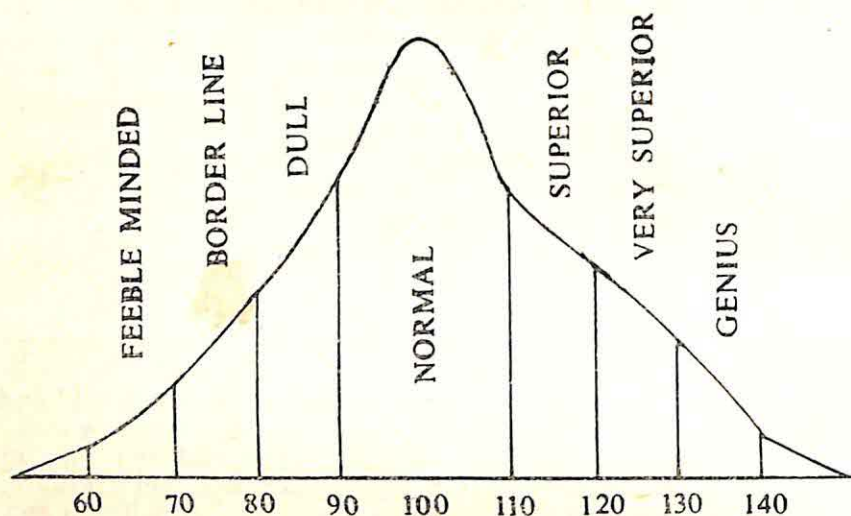
<i>I.Q.</i>	<i>Number of Children Per Cent</i>
56- 65	0.33
66- 75	2.3
76- 85	8.6
86- 95	20.6
96-106	33.9
107-115	23.1
116-125	9.3
126-135	2.3
136-145	0.55

The following is the distribution of the I.Q. per hundred among population of a country given by P. Sandiford.

CONSTANCY OF THE IQ

Constancy of the I.Q.

With regard to the consideration of constancy of I.Q. there are



CONSTANCY OF THE I.Q.

many authors which have investigated whether or not I.Q. remains constant. This is very vital to educational planning. The constancy of the I.Q. can be explained in two senses. In the first sense it means that in respect of mental improvement the I.Q. remains unchanged. The I.Q. always measures the proportion of mental age to physical age for the measurement of which it is meant. If an individual's physical and mental age be 8 and 10 respectively, and his I.Q. therefore be 125, then this I.Q. must be the measure of his age level. In this sense the constancy of the I.Q. does not mean that an individual's I.Q. is constant absolutely, but that in relation to the age level to which it is applied, it remains constant. In the second sense the constancy of the I.Q. means that an individual remains constant throughout his life in spite of education, training, experience and other environmental forces. Theoretically speaking, the I.Q. may be constant. But in practice, though intelligence remains constant, the I.Q. does not do so. Firstly, intelligence tests are not true measuring rods, therefore constancy is neither real nor desirable. Secondly, fluctuation of the I.Q. in individuals cannot be denied. Freeman says that I.Q. of the intellectually gifted children changes more extensively and throughout a longer period of life, than that of those of normal intelligence. Welman said that the I.Q. of the pre-school children undergoes appreciable increase. On the basis of the I.Q. of adopted and twin children, Freeman thinks that the I.Q. of young children may greatly increase due to the forces of the environment. Terman thinks that change of the I.Q. may be due to the normal rate of child's growth. In spite of the fact that the I.Q. of some pupil does vary from time to time, there is no doubt about the fact that relative constancy in the vast majority

of children seems to be the rule. (For further details see Chapter on 'Human Abilities'.)

Heredity and Intelligence

As a matter of fact, intelligence is an innate or hereditary capacity. One is born an idiot, while another is an inborn genius. No amount of drilling or educational effort improves an idiot, while a small opportunity given to a genius fully develops his intelligence. Sir Francis Galton says that superior intelligence is inherited and feeble mindedness runs in families. Yet intelligence is not a single or simple ability. It is manifested through conduct. Though intelligence is hereditary, its development depends upon environment. Environmental factors like education and experience cannot change the innate nature of intelligence, they can change only its field and scope. Vertically it remains the same. Horizontally it changes.⁵ (For detailed study see Nature-Nurture balance sheet in 'Human Abilities' chapter.)

Development of Intelligence

Intelligence does not remain stagnant, or inert, it changes and develops.⁶ Intelligence tests have proved that from child's birth to maturity an individual's intelligence changes in character. Intelligence tests have also shown that intelligence goes on developing rapidly in childhood and comes to a standstill at 16. Again, the intelligence of a very intelligent child develops more rapidly and throughout a longer period than that of an average intelligent one. Intelligence ceases to develop after maturity is attained and is on the wane with old age. There is difference of opinion as to the definite age level when intelligence is fully developed. According to Binet it is 15. According to Terman-Merrill it is 16 and according to Otis-Munres it is 18. Thorndike thinks it is to be the school level age, while Doll regards it as 13. In conclusion, it may be said that intelligence is fully developed between 14 and 16 on the basis of the modern methods of measurement. Intelligence develops in both depth and width. In the light of the actual intelligence test, it can be said that as both depth and width of intelligence are subject to change, the latter is more as compared to the former. For example the height or depth of intelligence as determined by mental capacity or the vertical intelligence of an individual when he is 40 is equal to that when he is 16 though his horizontal intelligence i.e., the scope of account or training is undoubtedly greater when he was 16. This means that intelligence has vertical as well as horizontal

5. *ibid.*, p. 151.

6. *ibid.*, p. 150.

growth. Upto 16 it may be vertical and after 16 it may be horizontal. (see Fig. 2)

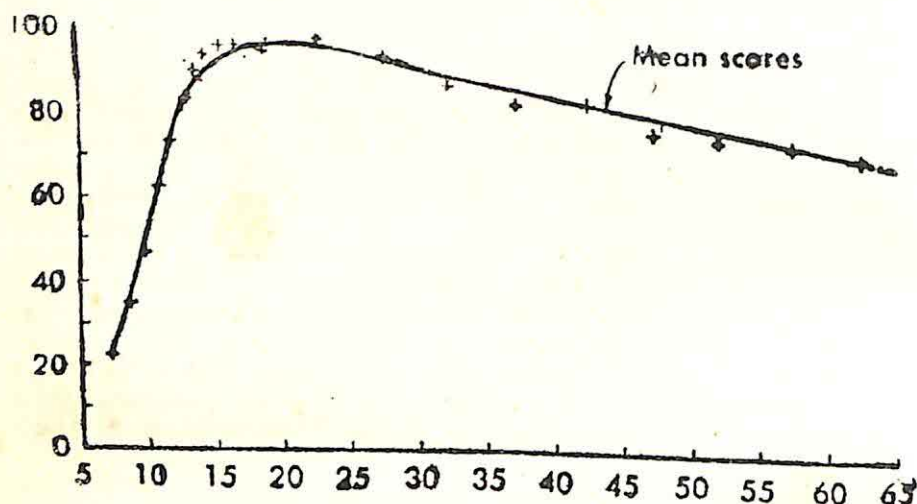


FIGURE 2

Curve of mental growth decline as measured by Wechsler Bellevue Scale.

Outstanding Tests of Intelligence

The tests of intelligence according to Bhattacharya are Binet tests, group tests, performance tests etc. The detailed description is given below:

Binet, in collaboration with Simon, investigated the cause of intellectual backwardness of children reading at the municipal schools in Paris and discovered the first workable tests to measure their intelligence. Binet prepared his tests in 1900 and revised them with the assistance of Simon in 1905, 1908 and 1911. In the last a battery of five tests was fixed for each age level except that of four, for which only four tests were laid down.

The Binet-Simon tests consist of varied questions and problems, for they do not measure a single or simple ability, but at least three abilities combined, viz., the ability to understand 'direction', to maintain a 'mental set' and to apply 'auto-criticism'. The tests are called scales, for they contain measures of intelligence of different age levels from 3 to 15, arranged in an order of increasing difficulty or complexity. Intelligence scale is divided into years and months. It consists of 45 tests which enabled Binet to measure the varied phases or manifestations of intelligence. On the basis of his intelligence tests Binet discovered the mental age. For example, the child who can answer at least 50 per cent of the questions standardised for the 3-year age level, has 3 for his M.A. though his C.A. may be more or less than, or equal to it.

The Binet-Simon tests have been tested, revised, translated and supplemented by other test psychologists, to adapt them to the individual peculiarities of different countries. Of these revisions, those made by Goddard, Kuhlmann, Cyril Burt and specially by Terman-Merrill, are important. In 1910 Goddard translated the tests and adapted them for American use. Burt's London Revision represents a later adaptation of the Binet tests to the genius and needs of the London children. He did not leave these tests unchanged, but even replaced them by new tests to measure the intelligence of bright children. Kuhlmann devised tests for children below three.

Point Scale

A deficiency of the Binet tests is that either a testee scores full marks or he scores zero according to which he answers to them. This is an injustice done to the testees, for the tests may be such as are either known or unknown to them. This one-sidedness may be removed if partial credit be given for answering different parts of the scale. The point-scale was devised by Yerkes, Bridges and Hardwick to achieve this end. It accommodates the majority of Binet tests. But instead of pursuing the whole-or-none method, it follows the part-method of awarding points to the testees for passing a part of the tests.

Terman-Merrill or Stanford Revision

In 1916 the 'Stanford Revision' was made by Terman and Merrill to correct some deficiencies of Binet tests. For example, the Binet tests meant for the lower age-levels were extremely difficult. Terman and Merrill brought in proportion in these tests. Again, acting on the hint suggested by Stern, they found out the method of calculating the I.R. and the different levels of intelligence on its basis. Binet's scale started from 3 years while the test revised by Terman and Merrill started from 2 years. The first consisted on 54 questions, while the latter contained 120.

Binet-Simon Scale

The following is the Binet Scale as revised in 1911:

3 Years

- (1) Naming the nose, the eyes, and other limbs of the body.
- (2) Saying what objects are there in a picture.
- (3) Repetition of two numbers on hearing them.
- (4) Saying the surname.
- (5) Repetition of a six-worded sentence on hearing it.

4 Years

- (1) Saying whether the testee is a boy or a girl.
- (2) Naming keys, knives, coins etc., on seeing them.

- (3) Repetition of three numbers on hearing them.
- (4) Comparison of the length of two straight lines.

5 Years

- (1) Comparison of two weights one pair three and twelve grams respectively, the other pair, six and fifteen grams respectively.
- (2) Copying a square with pen and ink.
- (3) Putting together two triangles so as to make them the same form as a rectangle.
- (4) Repetition of a ten-worded sentence on hearing it.
- (5) Counting four pennies.

6 Years

- (1) Saying the difference between morning and evening.
- (2) Saying the meaning of several common words.
- (3) Drawing the shape of a diamond card on seeing it.
- (4) Saying which among a number of pictures is beautiful and ugly.
- (5) Counting thirteen coins.

7 Years

- (1) Showing the right hand and the left ear.
- (2) Describing a given picture.
- (3) Carrying out three orders given at the same time.
- (4) Counting the value of six coins of which three are double.
- (5) Naming four principal colours.

8 Years

- (1) Comparison of two things by memory.
- (2) Counting zero from twenty.
- (3) Noting the omitted parts of a picture.
- (4) Stating the date and the day.
- (5) Repetition of five numbers.

9 Years

- (1) Calculating with small coins.
- (2) Saying the meaning of words.
- (3) Recognising a number of current coins.
- (4) Answering on grasping the central idea of easy questions.
- (5) Naming the months of the year alternately.

10 Years

- (1) Arranging five blocks or wooden pieces according to weight.
- (2) Drawing two pictures on recall after seeing them.

- (3) Showing the unreality of absurd words.
- (4) Answering on grasping the central idea of difficult questions.
- (5) Framing sentences illustrating the given words.

12 Years

- (1) Finding out the absurdity of some statements.
- (2) Framing a sentence with three given words.
- (3) Saying six words in three minutes.
- (4) Saying the meaning of an abstract word.
- (5) Framing a meaningful sentence with some words arranged without order.

15 Years

- (1) Repetition of seven words.
- (2) Saying three words in a minute keeping rhyme with a given word.
- (3) Repetition of a sentence consisting of twenty-six parts.
- (4) Explaining the meaning of a picture.
- (5) Making substances.

For the adult

- (1) Solving several problems of paper-cutting.
- (2) Reconstructing a triangle in idea.
- (3) Distinguishing a number of abstract words.
- (4) Distinguishing between the President and the King.
- (5) Saying the substance of a prose-piece read out.

(a) Performance Test

The above intelligence tests involve the use of language. So these are inapplicable to the illiterate, deaf, mutes and foreigners. Such persons may, however, show their intelligence through Performance Tests or the manipulation of concrete objects. Form-board, picture-completion, *maze exploration* etc., are types of performance tests. For example, in the form-board tests the testee is given wooden blocks of different shapes to fill in with them, at a given time, the vacant holes of the board cut into those shapes. In the picture-completion test, again, some parts of a given picture are kept incomplete to be completed at a given time by the testee.⁷

(b) Tutoo Maze Test

1. General Description

This test belongs to a psychomotor group of instruments and, from its usage, it owes its development to several works based on

7. *ibid.*, p. 155.

various experimental studies undertaken with the help of the preliminary forms of the test. As an instrument, this test has shown to have several applications in the field of testing, counselling, personality assessment etc.

The test consists of three spirals which are placed side by side with the construction that movement is to proceed from right to left in direction.

A subject has to trace a distance of 210 cms. roughly inside the pathway. The space in the pathway varies from loop to loop and its width in the beginning is larger but the same narrows down gradually. Several obstacles are placed on the pathway and obstructions are to be carefully negotiated to avoid a touch with the boundary which is counted as an error.

The subject is required to trace the course of the pathway using a pencil and whenever he or she goes off the pathway he or she loses marks. The subject is required to complete the tracing as quickly as possible but correctly.

The subject is to complete three trials. And the average of these three trials is to be taken as his or her final score.

The subject is to be given necessary instructions before starting the test so that he or she fully understands as to what he or she is to do. As soon as instructions are clarified, the subject is to run the pathway starting from the right end and to leave the pencil out from the left outlet. In the last loop, the subject is to be told to be faster to enhance score value.

2. Test Data:

(a) Validity :

With Gibson Maze Test

(i) On time score = .796

(ii) On error score = .386

(b) Other findings :

(a) Time Score

(i) Mean = 80.50 seconds

(ii) S. D. = 19.67 seconds

(b) Error score

Mean = 24.46

S. D. = 13.00

(c) Age

(i) Time Score	Age levels				
Statistics	13	14	15	16	17
Mean	89.50	78.82	88.39	77.69	77.50
S. D.	18.70	17.09	16.40	21.74	25.73

(ii) Error score :	Age levels				
Statistics	13	14	15	16	17
Mean	23.97	23.77	25.28	24.96	24.30
S. D.	12.46	9.36	12.13	11.20	12.80

(d) Class level	Mean	S.D.
8th	87.73	17.19
9th	79.07	15.84
10th	77.84	19.89

3. *Scoring system*

- (i) Count 0 error for no touch with the boundary or an obstacle.
- (ii) Count $1/2$ EACH for *every just one touch* with the boundary or an obstacle.
- (iii) Count 1 EACH for *every little deep touch* with the boundary or an obstacle.
- (iv) Count $1\frac{1}{2}$ EACH for *every crossing* into the boundary or an obstacle.

Write down the time taken by a subject on each test sheet immediately.

Total all the errors of three trials and divide them by 3. This will be actual (average) score. There will be separate average time and average error scores for every subject.

Administer 3 trials on a subject without a rest pause between trials.

4. *Applications of the test*

(a) The field data, that would accrue from this test, would help to evaluate the constructs an aptitude psychology, to clarify the theory on mental measurement, to standardize an awareness on trait training, to evaluate the technique of assessment for vocational wisdom, and, also, to study the nature and nurture of creative talent among adolescent universe to suitably train them for academic excellence and to prepare them for managership roles based on facets of aptitude powers.

- (b) The test has several applications. It can be used for:
- (i) Trade classification work where hand-eye coordination is required.
 - (ii) Selecting personnel who are required to have finer motor skills, and
 - (iii) Studying subjects regarding the processes like stress tolerance, accuracy of hand movements, perceptual speed, spatial orientation, motor speed, emotionality, character stability etc.

Group Tests

Again the defect of the above test is that they are confined to one individual at a time. But when the number of testees is too large to be tested in a short time, it becomes necessary to test many individuals at a time. Group tests like the Alpha and Beta Tests as employed by the American Army psychologists serve this purpose. But such tests, again, are not self-sufficient. The intelligence of persons is not properly tested by examining a group of them in a short time. So group tests have to be supplemented by individual tests.⁸

Intelligence Tests for Adults

The finding out of the I.Q. of the adult is a difficult problem. In doing so it should be kept in mind that test psychologists generally regard 16 as the deadline beyond which age-level real intelligence ceases to develop. That is to say, an individual however above 16, must be regarded as 16 in his chronological or actual age. Mental age also does not change indefinitely. Test psychologists hold that the mental age of normally intelligent persons is about 16, that of subnormal ones is from 3 to 11 and that again of exceptionally intelligent individuals is from 20 to 32. If the C.A. of a normal person is 36, both his C.A. and M.A. are to be taken as 16 and his I.Q. as 100. Again, if the C.A. of an idiot is 36, it is to be taken as 16 and his M.A. being 3, his I.Q. works round $\frac{3}{16} \times 100 = 20$. Lastly a genius aged 36 is really 16 with his M.A. as 24 and I.Q. as $\frac{24}{16} \times 100 = 150$.

It may be objected that to regard two persons of 16 and 36 at both in M.A. is to be partial to the younger of the two, considering as it does, the development of intelligence as halted at sixteen. Let it be answered that though the M.A. in both cases is the same, it is not intended that intelligence ceases to develop altogether after 16. Intelligence develops along with the two lines, viz., vertical and horizontal. The first relates to real intelligence which consists in powers of reasoning, remembering, covering and judging, and the second of the number of scope of objects with which intelligence is

8. *ibid.*, p. 156.

connected. The first is usually fully developed at 16 and does not change appreciably in later life. The second, on the other hand, goes on developing with increasing age upto a certain limit.⁹

Importance of Intelligence Tests for Parents and Teachers

The importance of intelligence tests is discussed in the following paragraphs :

(i) The first practical use of intelligence tests is their efficacy in classifying pupils in schools according to ability. Instruction must be adapted to the intellectual abilities of pupils in a class, which commonly consists of backward, dull, average, bright and very bright boys or girls. Intelligence tests have gone to show that most of the children are mediocre, while the number of talented children and the idiots is comparatively small. Hence the problem of classification of pupils according to their intellectual ability has been recently recognised to be an important one.

The classification of pupils according to intelligence may be either vertical or horizontal. The vertical classification is based on mental capacity alone without regard to any other factor. Pupils are placed in a particular school grade according to the level of achievement. According to the horizontal classification, pupils are grouped in particular classes according to their abilities.

(ii) The failure of a certain pupil in a school grade is not always due to his inherent incapacity. So, the problem is not solved only if he is placed in a lower grade. Intelligence tests are of valuable aid to the educationist as a means of diagnosis of the capacity of pupils.

(iii) The courses of study for which a pupil is fit and length of time a pupil can profitably remain in school are determined by his general intellectual ability or the special capacity he may possess. So a third importance of intelligence test consists of Educational Guidance.

(iv) The selection of the types of work which the pupil takes in school prepares him for the type of vocation which he shall pursue. Thus, educational guidance leads to vocational guidance. The importance of tests of general capacity is based on the assumption that various vocations require for their successful pursuit different degrees of intellectual capacity. Evidence goes on to support this assumption. The application of intelligence test for vocational selection, again, consists in their use in selection, transfer or promotion of employees.

(v) In order to ascertain what degree of responsibility should be reposed on and what kind of treatment should be given to juvenile

delinquents and criminals, intelligence tests have been applied to them. There has been a general agreement among the psychologists that mental incapacity is responsible for large number of crimes. Some hold, however, that it is, on the whole, a relatively minor cause.

(vi) The final practical use of intelligence tests is the measurement of the efficiency of educational units. Intelligence tests measure native capacity, while educational tests measure the result of training. So the relationship has been expressed in the form of a ratio which is called the achievement quotient or the accomplishment ratio.

(vii) Determination of the character of the mental growth of children is a theoretical problem. The application of various mental tests to children of various ages provides us with data which form the basis for fairly valid estimates of the character of their intellectual growth. Mental growth is measured by the result of tests applied to different children of different ages. Hence, we have only a mass picture of the general characteristics of mental growth as distinguished from individual differences relating to it.

(viii) Intelligence tests throw light on the question whether individual differences in mental capacity are the effect of heredity or environment or both. The question is whether individual differences depend largely on differences in their inherited mental traits or they are the product of differences in training. The problem of "the relative effect of heredity and environment", as Freeman observes, "is in reality a problem in the interpretation of the test scores themselves."

(ix) Lastly, intelligence tests enable us to study the interrelationship of mental traits and to investigate mental types. The study of correlation of the scores of intelligence tests enables us to determine whether mental types or groups of abilities found in conjunction with one another exist at all or not.

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HUMAN ABILITIES

The Nature of Mental Abilities

IN education we are primarily concerned with the adjustment that the child makes to his social and physical environment and this adjustment is essentially the child's learning. Learning is related to the abilities of the learner and particularly to the learner's mental abilities. For this reason it is proposed to begin with an examination of the research evidence concerning the nature of mental abilities.

British and American psychologists often differ in the typical analyses of abilities that they favour, the British generally leaning towards a view that abilities are essentially unitary or holistic in their nature, the Americans towards a view emphasising the diversity and atomistic nature of abilities. The writings of Vernon and Burt would represent the present British viewpoint and those of Thurstone, Guilford and Bayley would be representative of an American approach.

Group-Factor Theory on Human Abilities

The current British viewpoint concerning mental abilities could be summed up in what is called the hierarchical group-factor theory as expressed by Burt¹ and Vernon². It is an extension and a refinement of the early work of Spearman³. In his early writings Spearman postulated a two-factor theory, maintaining that mental abilities could be explained in terms of a broad general factor manifesting itself in all cognitive activities involving neogeneses, designated 'g', and numerous specific factors designated 's'. The theory of two factors, g and s, s, s... appears to have imprinted itself

1. Burt, C., "The Differentiations of Intellectual Ability", *Brit. J. Educ. Psychol.*, 1954, 24, 76-80; "The Evidence for the Concept of Intelligence", *Brit J. Educ. Psychol.*, 1956, 25, 158-77.
2. Vernon, P.E., *The Structure of Human Ability*, London, Methuen, 1951.
3. Spearman, C., *The Abilities of Man*, London, Macmillan, 1927.

indelibly upon the minds of educationists, because later, and rather grudgingly, Spearman admitted the necessity for another set of factors which ran through groups of but not all, mental activities and hence could be designated 'group factor'; but the theory of two factors continued to dominate the thinking of Spearman's followers. A group factor could be thought of as representing an aptitude for a particular type of activity such as mechanical, verbal, arithmetical activities, etc. It could be said that Spearman minimised the importance of these aptitudes and stressed the unitary nature of mental abilities as dominated by a massive 'g' component.

Burt and Vernon have clarified the nature of the group factors and re-adjusted the emphasis. Group factors are now classified as major group factors, (two), verbal-educational and practical-mechanical, and several minor group factors—number, verbal, mechanical information, spatial, manual dexterity, (Vernon 1951). The work of mental abilities in more recent years has rather reduced our conception of the generality, or importance of 'g' and rather increased our conception of the importance of the group factors.

In education we have come to think of 'g' as represented by general intelligence and this in turn reflected by the I.Q. That is, it is widely held among teachers that a child's performance in school subjects is dominated by the child's general intelligence of which the child's I.Q. is a very good estimate. Therefore, it is proposed to advance evidence of the comparative importance of 'g', the group factors and specifics in mental tasks such as performance on scholastic tests, at the primary level and performance on intelligence tests.

The data now being presented are taken from Burt (1954), who advanced it in support of the differentiation hypothesis (which will be considered later), but it serves our present purpose equally well. Burt (1954) tested 294 boys and 252 girls with standardized educational tests at intervals of two years. The results were factor analysed into a general factor and three group factors...The per cent of the variance accounted for by each factor at the age levels tested was as follows :

	Age 8+	Age 10+	Age 12+
General factor	52.1	35.6	27.8
Verbal group factor	7.3	9.3	10.7
Arithmetical group factor	3.1	3.0	13.4
Manual group factor	2.5	5.9	6.5

The per cent of the variance not accounted for by the above factors is due to specifics for each test and errors of measurement

and a little arithmetic will show that these amounted to 35.0 per cent at age 8+, 6.2 per cent at age 10+ and 41.6 per cent at age 12+. If we combine the contributions of the three group factors, then they account for 12.9 per cent of the variance at age 8+, 18.2 per cent at age 10+ and 30.6 per cent at age 12+. Clearly then factors other than the general factor have a quite important bearing upon the school performance of children.

Also the relative contributions of the general factor, the group factors and the specific factors may be examined relative to performance on intelligence type tests. Burt (1954), with the help of Mr A. Reid, examined a group of over 300 boys with tests of aptitudes at age 9.0 to 10.0 years and four years later the same group was retested with the same tests. A factor analysis of the two sets of results revealed a general factor and five group factors, the contributions to the variance of each factor at each age level being as follows :

	Age 9.0 to 10	Age 13.0 to 14
a. general cognitive ability	0%	0%
or intelligence	53.1	48.2
b. 'intellectual ability'	5.4	10.3
c. 'practical ability'	4.7	11.0
d. mechanical memory	2.1	3.9
e. visual perception	1.5	3.8
f. motor dexterity	2.4	7.0

Again, simple calculations show that on these tests the general factor accounts for approximately half of the variance. In addition Vernon (1951 p. 23) made an analysis aptitude and scholastic test given to 1,000 army recruits in which the general factor accounted for 52.5 per cent of the variance, and three group factors combined accounted for another 24.0 per cent.

These figures have been presented to show that while the general factor is important to a child's school performance there are other factors which are also important, and together, they are about equally important. In a later section evidence will be produced to indicate the ability of general intelligence tests to predict primary school achievement and these results, again, are in keeping with the conclusion arrived at here.

The American Viewpoint Regarding Mental Abilities

The traditional British viewpoint has been to regard mental abilities as homogeneous and unitary—dominated by the general factor, plus some small subsidiary pieces, and to favour techniques of factor analysis which support this view. The Americans tend

to view mental abilities as numerous and diverse, and in turn to favour techniques of fact analysis which support a more atomistic view of relatively independent mental traits. Historically the work of Thorndike and more recently that of Thurstone and Guilford support such a viewpoint.

Thurstone postulated a number of independent, but related, mental abilities which he calls mental traits. Seven mental traits have been identified but it is possible that additional traits may yet be elucidated. These traits are of varying degrees of generality or importance, the order of importance being approximately that in which they are here named: V (verbal comprehension), R (reasoning), N (number), S (spatial relations), P (perceptual speed), W (word fluency) and M (associative memory).

Thurstone then developed a battery of Primary Mental Abilities Tests, each test designed to be a factorially pure measure of a particular mental trait.

More recently still Guilford⁴ in his description of the structure of intellect, has postulated, firstly, five kinds of mental processes or operations, namely: cognition, memory, convergent thinking, divergent thinking and evaluation, so that we have five major groups of intellectual abilities. Secondly, a classification can be made according to the content, or kind of material involved, namely: figural, symbolic, semantic, and behavioural. The third and final classification is in regard to the kind of product which may emerge when any one type of operation is applied to any one kind of content. There are six kinds of products, namely: units, classes, relations, systems, transformations, and implications. Therefore Guilford's view of the intellect can be represented as a cube-like structure of dimension 5 (processes) \times 4 (contents) \times 6 (products) and therefore comprising 120 possible divisions.

The American tendency to regard human mental abilities as numerous and diverse leads to the conception of possible wide intra-individual differences in abilities—that is, a child could be quite superior in one area of mental functioning and quite inferior in some other area, a possibility which could hardly occur if mental functioning is dominated by one massive general factor, namely 'g'. The demonstrated facts on intra-individual differences will be presented in another section, where it will be shown that as far as school subjects are concerned they are in fact quite large.

The Importance of General Intelligence

The usefulness of the concept of general intelligence essentially rests upon the usefulness of tests of general intelligence in education,

4. Guilford, J., "Three Paces of Intellect." *Amer. Psychologist*, 1959 (a) 14, 469-479; Paper presented at interdisciplinary symposia on creativity. In *Creativity and its Cultivation*, Ed. Anderson, H.

and this in turn rests upon the ability of intelligence tests to predict school, and possibly vocational performance. In schools, intelligence tests may be used in grouping children—e.g., into homogeneous classes (streaming), in educational and vocational guidance, and in selecting pupils for remedial work. In all these functions their usefulness depends upon their capacity to predict future performance and the nature of the situation often implies prediction over a long time span. In turn prediction over relatively long periods of time involves considerations of the stability, or constancy of the I.Q. Therefore, research evidence is required on two points: firstly, the validity of the I.Q. as a predictor of school achievement; and secondly, the stability, or constancy of the I.Q. as an index of the child's brightness.

The Validity of the I.Q. as a Predictor

Research findings on this point have been published by Vernon (1951), Cronbach⁵ and Schonell.⁶ Vernon (1951) quotes data published by Gates which shows averages of correlations obtained between four measures of reading and a measure of intelligence for children between 8 and 14 years. The average correlation between intelligence and reading comprehension was +0.59 between intelligence and rate of reading +0.50, and between intelligence and vocabulary +0.52. The Encyclopaedia of Educational Research in summarizing the work of Margaret (1948) and Cronbach (1949) concluded that correlations between I.Q. and school grades averaged between +0.50 and 0.60.

In summary, it is apparent that the I.Q. is a moderate predictor of academic achievement in the primary school—the usual correlation approximating +0.55. Co-efficients of this order account for approximately 30 per cent of the variability measured in children's scores. It is apparent that a very large percentage of the variability is attributable to factors other than those measured by the intelligence test.

The Stability of the I.Q.

Already it has been established that the I.Q. is only a moderate predictor of school achievement. Also there has been a tendency to regard the I.Q. as innately determined and therefore possessed in some 'fixed' amount by every child. The relative importance of nature and nurture in contributing to measured I.Q. will be discussed in another section but it is apparent that the concept of fixed, inborn intelligence implies an I.Q. that is constant or stable, within the errors of measurement. The concept of fixed intelligence also leads teachers to think in terms of labels attached to children—e.g.,

5. Cronbach, L., *Essentials of Psychology Testing*, New York, Harper, 1949,

6. Schonell, F., *Backwardness in the Basic Subjects*, Edinburgh, Oliver and Boyd, 1948.

the child has an I.Q. of 80 and is immediately and permanently, thought of as 'dull', in all phases of intellect. The stereotype of thought often freezes the teacher into a limited and restricted mode of behaviour towards the child, and expectations of his performance which are prejudicial to the best mental growth. Again children may be put into groups on the basis of test results, which are in fact fairly permanent 'stream's, and again the child is frequently 'frozen' in a particular stream, the teacher and the child both adopting the role behaviour that the stream implies. Because of these considerations it is necessary to examine research evidence on the stability of the I.Q.

Sontag, Baker, and Nelson⁷ report a longitudinal study based on the yearly testing with the Binet of some 80 children. Their results apply to children of pre-school as well as primary school age. These writers maintain that the 'follow-up method of study has aided in dismissing the idea that the I.Q. is constant over any period during childhood.' The longer the interval between the two (intelligence) tests the less the reliability. Larger increments of change were found during the pre-school years. The writers claim that the extent of I.Q. change during childhood has been previously underestimated, as they found a median change of 17.9 I.Q. points. A change of 15 I.Q. points or more, at some time in the course of mental development between ages 3 and 10, was found in 62 per cent of the children. The extent of the I.Q. variation, and by converse the extent I.Q. reliability, can be inferred from the following table of inter-age Binet I.Q. correlations.

Inter-Age Binet I.Q. Correlations

Age	4	5	6	7	8	9	10	11	12
3.	83	72	73	64	60	63	54	51	46
4.		80	85	70	63	66	55	50	43
5.			87	83	79	80	70	63	62
6.				83	79	81	72	67	67
7.					91	83	82	76	73
8.						92	90	84	83
9.							90	82	81
10.								90	88
11.									90

Seeing that the present concern is with the primary school child, it should be noted that the school years the reliability co-efficients are much higher, and this is especially so for children of 8 years of age, or more. As intelligence tests are rarely used educationally in

7. Sontag, L.W., Baker, C.T., and Nelson, V.L., *Mental Growth and Personality Development*, Society for Research in Child Development. Monograph, 1958. 23, No. 2.

this State with pre-school children, and not extensively with children under 9 years of age, the reported variability is of limited significance concerning educational practices in W.A. However, this study does contain a warning concerning the concept of I.Q., especially for those who continue to think of the I.Q. as unchanging, and who therefore tend to label children as 'dull', 'average' or 'bright' and then to think of the labels instead of the children, when we read that 'the greatest change in the smoothed I.Q. (the average of three tests) was a gain of 57.6 I.Q. points, from age 3 to 11 years, and the greatest loss 32 I.Q. points. The I.Q. can no longer be thought of as fixed.

Bayley⁸ investigated the stability of the I.Q. in the very young child, and in the adult. She claims that I.Q. measures taken early in life fail to predict I.Q. at a larger age. Also that members of the Berkeley Growth Study, when tested at the age of 25 were still improving their I.Q. rating, suggesting that among superior educated adults at least, the I.Q. is not constant, but rather that it continues increasing, possibly even up to the age of 50 years or more.

Honzik, Macfarlane and Allen⁹ reported that in a large number of youngsters tested repeatedly between the ages of 6 and 18 years, over one-half varied 15 or more I.Q. points, and over one-third changed as much as 20 points.

Further evidence could be cited regarding the stability or constancy of the I.Q., but it is quite clear that the notion of a fixed, innately determined I.Q. is untenable. In fairness it must be said that the greater amount of I.Q. variability occurs in the pre-school years and that after the mid-primary years the amount of variation is much less—a quite important consideration when it is remembered that in Western Australia intelligence tests are rather infrequently used for educational purposes before the mid-primary years.

The Nature-Nurture Balance Sheet

Various researchers over years have attempted to formulate a nature-nurture balance sheet. A brief reference will be made to the work of Burks,¹⁰ Burt, Shuttleworth¹¹ and Maddox.¹²

8. Bayley, N., "On the Growth of Intelligence." *Am. Psychol.*, 1955, 10, 805-818.
9. Honzik, M., Macfarlane, J. and Allen, L., "The Stability of Mental Test Performance between Two and Eighteen Years", *J. Exp. Educ.*, 1948, 17, 309-324.
10. Burks, B., "Foster-family Resemblances in Intelligence," Chap. 15 in *Child Behaviour and Development*. Ed. Barker, R. Kounion, J. and Wright, H. New York, McGraw-Hill, 1943.
11. Shuttleworth, F.K., "The Nature Problem." *J. Educ. Psychol.*, 1953, 26, 561-578.
12. Maddox, H., "The Nature-Nurture Balance Sheet." *Drit, J. J. Educ. Psychol.*, 1957, 27, 166-175.

Burks (1943), as a result of studies based on a comparison of foster parent-foster child resemblances and true parent-true child resemblances, came to the conclusion that 75 to 80 per cent, approximately, of the variance obtained on intelligence tests was due to hereditary factors (and 20 to 25 per cent to educational-environmental factors and error), although in special cases the influence of the environment may go far beyond this proportion. Burt (1956) maintained that at least 75 per cent of the test variance was due to hereditary factors and the remaining 25 per cent to environmental factors and error variance. Maddox (1957) quoting Vernon (1951), who in turn made reference to Shuttleworth, analysed the effect of environmental factors on intelligence test scores as follows :

- 64% Hereditary factors.
- 16% Environmental differences between families (inter-family differences).
- 3% Differences in upbringing between children in the same family (intra-family differences).
- 17% Joint heredity-environment factors, i.e., the correlation between heredity and environment.

While some might argue that it is fruitless to attempt to resolve the nature-nurture problem as the two interact, the purpose of advancing this data is to show that intelligent behaviour is partly, and to a significant degree, the outcome of experience, training, learning—in short, of education. While admitting that nature sets the limits, it is claimed that within these limits teachers can do a great deal to promote efficient intellectual functioning (thinking or coping behaviour) in pupils. Further, it is claimed that children acquire intelligent (and sometimes unintelligent) modes of behaviour from other children, especially from children who are slightly more intelligent than they are, and finally, that methods of intellectual functioning are learned from adults and teachers. Hunt¹³ claims that by a sound psychology of development we could raise the average intellect by an amount equivalent to 30 I.Q. points, and while not necessarily feeling obliged to accept or reject this particular figure, it can be accepted that desirable modes of education can, and do, lead to an increment in intellectual efficiency. Similarly educators should avoid permanently labelling people as innately and unalterably dull, average, bright, etc.

The Differentiation Hypothesis

It has been postulated—the differentiation hypothesis—the mental abilities become more specialised with maturity, that especially during and after adolescence, special aptitudes represented

13. Hunt, J., *Intelligence and Experience*. Ronald Press, New York, 1961.

by the group factors and specific factors in the hierarchical group factor theory of intelligence, become more important in mental functioning and that the general factor becomes correspondingly less important. It is proposed to consider the evidence advanced by Garrett,¹⁴ Burt, Vernon, Williams,¹⁵ Meyers and Bendig,¹⁶ Meyers, Dingman¹⁷ and O'Neil.¹⁸

The case for differentiation probably is presented best in articles by Garrett (1946) and Burt (1954), both claiming differentiation of abilities. The figures already quoted from Burt in this report (page 5)—giving the factor situation from the analysis of scholastic tests given to boys at ages 8+ and again to the same boys at ages 10+ and 12+—show that the general factor variance was 52.1 per cent at 8+ 35.6 per cent, at 10+, and 27.8 per cent at 12+, indicating a substantial decline in the importance of the general factor over this age span. The same study showed that the three group factors, namely the verbal, arithmetical, and manual factors, together contributed 12.9 per cent at 8+, 18.2 per cent at 10+, and 30.6 per cent at 12+, while specific factors (and error) variance was 35.0, 46.2 per cent, at each of the three age levels, indicating a substantial gain in the importance of the group and specific factors. Again, the figures quoted from Burt and Reid on page 5 of this report—giving the factorial composition of a battery of aptitude tests administered to a sample of children at ages 9-10 years and again at ages 13-14 years—showed that the general factor accounted for 53.1 per cent of the variance at age 9-10 and 48.2 per cent at age 13-14 years. The combined group factors accounted for 16.1 per cent at age 9-10 years and 36.3 at age 13-14 years.

In a comparatively short report it is impossible to quote all the evidence. Garrett (1946) and Burt (1954) are conspicuous among those who have supported differentiation and Burt in particular has claimed that differentiation was due to the maturational unfolding of innate potential. In recent years most studies have indicated that the degree of differentiation is not significantly different in adolescence from that in the primary school years. Vernon (1951) tested boys at 14 and naval-recruits 18 and found that the general factor saturations were almost identical. Williams (1948) tested boys at ages 12, 13 and 14 and found general factor variances that

14. Garrett, H.A., "Developmental Theory of Intelligence." *Am. Psychol.* 1946, 1, 372-378.
15. Williams, H., "Some Aspects of the Measurement and Maturation of Mechanical Aptitude in Boys aged Twelve to Fourteen." Unpublished thesis, University of London, 1948.
16. Meyer, W.J., and Bendig, A.A., "Longitudinal Study of the Primary Mental Abilities Test." *J. Educ. Psychol.*, 1961, 52, 50-60.
17. Meyers, C., Dingman, H., "The Structure of Abilities at the Pre-school Ages." *Psychol. Bull.*, 1960, 57, 514-532.
18. O. Neil, W., "The Stability of the Main Patterns of Abilities with Changing Age." *Aust. J. Psychol.*, 1962, 14, 1-8.

increased with age, indicating greater integration rather than differentiation. Meyer and Bendig (1961) in a longitudinal study based on the Primary Mental Abilities tests, found no evidence for increased differentiation from Grade 8 to Grade 11, while Cohen (reported in the *Encyclopaedia for Education Research*) found that children exhibited a smaller degree of generalized intellectual functioning than did adults. O'Neil (1962), summing up the research evidences on this topic, says that there is no real evidence to support the claim for increased differentiation. My comments on this subject would be that the degree of generality of the abilities of the primary school child probably was exaggerated in the earlier writings, and secondly, that such differentiation as has been observed can be explained as an outcome of differentiated schooling already received rather than evidence of unfolding maturational processes.

The Origins of Intelligence

Early works in the field of mental abilities had claimed that general intelligence was genetically determined and therefore was constant throughout the life span of the child. General intelligence was conceived as one of the 'givens' which the educator should accept in his efforts to educate the child. Any observed variation in intelligence, as reflected in differing I.Q. assessments, were put down to errors of measurement. Intelligence seems to have been conceived as 'a thing' or a 'causative agent possessed in different degrees rather than as a construct to summarize an observed level of functioning.'

This early, and erroneous view has lingered among many educators and teachers, who at least act in respect to children 'as if' they were dealing with organism endowed with some given and specified amount of this 'magical thing'. It is true that heredity does determine the actual physical basis of intellectual functioning—in the number of brain cells, the cells of the nervous system, etc.—so that 'biological intelligence' is heredity determined, but it is equally true that through experience and education patterns of adjustive behaviour develop which the child uses as tools in coping with the environment—that is, in behaving intelligently or otherwise. In short experience, training, school and other such activities which in their totality comprise education have an appreciable influence on the child's performance on intelligence tests as well as on his general mental functioning. The work of Hebb,¹⁹ Harlow,²⁰ and Riesen²¹ give interesting insights on how intelligent behaviour originates,

19. Hebb, D.O., *The Organisation of Behaviour: A Neurological Theory*, New York, John Wiley and Sons, 1949.

20. Harlow, H., "The Formation of Learning Sets." *Psychol. Revision*, 1949, 56, 51-65.

21. Riesen, A., "Visual Discrimination by Chimpanzees after Rearing in Darkness." *Amer. Psychologist*, 1947, 2, 307.

and the work of Piaget is relevant although it will not be cited in detail in this section.

Hebb (1949) found no diminution of intelligence test results among mature people even after removal of upwards to 20 per cent of the mass of cerebrum, whereas cerebral lesions in infancy results in retardations and markedly inferior mental ability. Hence the idea that brain tissue needed for the development of intellectual functioning is not so needful for its maintenance, and the distinction between primary learning and later learning, the former being characteristically slow because autonomous central processes have to be established. Early primary learning apparently establishes central processes in the associative areas—called phase sequences. Hebb distinguishes between intelligence A, biological intelligence, and intelligence B, functioning intelligence.

Harlow's study on learning sets (1949) might be called a demonstration of how (an animal) learns to learn. The animals (apes) were confronted with a series of problems each requiring for its solution a discrimination between two colours. On the early problems the animal's scores were only slightly above chance but after experience and education in this type of problem the animals averaged 97 per cent success on the second trial. These 'educated' animals were sensitive to a type of cue to which they were unresponsive before training. One could say they had acquired 'insight' or that they had acquired the capacity to utilise information given them.

Yet another study of Harlow (1951) again concerned learning sets but this time what is called the oddity problem. In this problem the animal is presented with three cups under one of which is a reward. Position and perceptible characteristics (colour, shape, size) are rewarded randomly but the odd object is regularly rewarded. After training—typically 400 trials on various problems of this kind—the animals achieve a level of 90 per cent; correct solutions on the first trial. They have learned the concept of oddness.

Riesen (1947) reports how chimpanzees deprived of normal visual stimulation for the first 16 months of the life were markedly inept in visual skills. They could not fixate objects, the blink response was not present, and vision was inferior in acuity. These visual deficiencies were attributed to a lack of primary learning, or the absence of central neural processes typically acquired in the course of living.

Piaget's description of the stages of intellectual development—the sensori-motor, concrete operations and formal operations—is an *outline of* the manner in which higher forms of intelligence are achieved. A point brought out in many of the Piaget replication

studies—King,²² Lovell and Ogilvie,²³ Case and Collinson,²⁴ Dodwell,²⁵ and Biggs,²⁶ is that the child's experiences and the education he has received considerably influence the attainment of the stages. Lovell and Ogilvie point out the importance of 'sheet experience of the physical world'.

The purpose of this section has been to show that intelligent behaviour is to an appreciable degree the outcome of experience and education, which means that by enlightened procedures it is possible to build in 'intelligence' to a degree which will significantly influence the child's mental functioning.

Mental abilities have been discussed in this section and learning will be the topic of the following section. Historically, it has been usual to think of these two topics as distinct and separate. Recently there has been a tendency to think of them under the one set of principles. For example, a recent unpublished thesis by Allison²⁷ investigated the inter-relationship of learning parameters and human abilities and concluded that 'measures of learning and measures of aptitude and achievement, which have generally been treated experimentally as separate entities, have factors in common with each other.' The present tendency, then, is less to regard intelligence as a fixed-inborn attribute on which the educator works, but to regard it as partly the result of experience and education, and this in turn implies that more thought must be given to the nature of learning activities which will not only increase the pupil's knowledge, but will also increase his capacity to solve problems, to plan, to organize, design and control—in short to cope with life's problems in an intelligent manner.

Individual Differences

The material of this section is largely based upon the results of the A.C.E.R. Seminar on individual differences held in Melbourne in August 1962, but other sources include standard works in this area, particularly the Sixty-first Yearbook of the National Society for the Study of Education, Part-I (1962) Goodlad and Anderson,²⁸

22. King, W.H., "The Development of Scientific Concepts in Children." *Brit. J. Educ. Psychol.*, 1961, 31, 1-20.
23. Lovell, K. and Ogilvie, E.A., "Study of the Conservation of Substance in the Junior School Child." *Brit. J. Educ. Psychol.*, 1960, 30, 109-118.
24. Case, D., and Collinson, J., "The Development of Formal Thinking in Verbal Comprehension," *Brit. J. Educ. Psychol.*, 1962, 55, 75-78.
25. Dodwell, P.C., "Children Understanding of Number and Related Concepts." *Canad. J. Psychol.*, 1960, 14, 191-205.
26. Biggs, J., "Teaching of Mathematics—I." "The Development of Number concepts in Children." *Educ. Res.*, 1959 (a), 1, 17-34.; "The Teaching of Mathematics—II." "Number anxiety." *Educ. Res.*, 1959b, 1, 6-21.
27. Allison, F., "Learning Parameters and Human Abilities." Unpublished Doctoral Dissertation, Columbia, 1962.
28. Goodlad, J., and Anderson, R., *The Non-graded Elementary School*. New York, Harcourt Brace, 1959.

Jenkins²⁹ and Stoddard.³⁰ It is proposed to consider evidence on the nature and extent of individual differences and some implications of these differences for educational procedures and planning.

The extent of human variability—that is of individual differences—was made clear by the development of psychological and educational tests. For example, if one takes all of the children aged 12 years in a large school, it is usual to find on the administration of an intelligence test that the range of I.Q.'s is approximately 70 to 140. If these I.Q.'s are converted into mental ages, the range of mental age is approximately from 8.4 years to 16.8 years, a difference of 8.4 years. Testing of primary grades with scholastic tests has shown that by Grade 4 or 5 there are children at nearly all levels of primary achievement in basic subjects, i.e., at all levels from Grade 1 to Grade 7 level. A study reported by the Queensland Education Department has shown that the range of attainment in reading in individual classes at the Grade 5 level was almost as great as the range for the whole state.

Without citing all the bulky evidence on this subject the following conclusions may be drawn:

1. Wide variability of performance occurs at all levels of primary school, and in all subjects.
2. There is increasing variability with increasing age—the higher the grade the wider the range of achievement.
3. Variability within a single class is great, in some cases almost as great as that for the whole State.
4. Pupils at Grade 5 and higher grades usually represent all primary achievement levels.
5. There is similar pattern for city and country classes.

Attempts to solve the problem presented by the wide range of abilities and attainments among pupils in a class have been of two kinds, firstly, efforts made by individual teachers in their own classes to cope with the problem, and secondly, attempts by administrators to find some form of organization—usually grouping or grading of classes which will alleviate the problem. The efforts of individual teachers are rarely published and therefore little is known of their effectiveness, although in some cases, no doubt, they have been highly effective. Many publications have dealt with organizational attempts to meet the problem—a recent publication outlines 36 methods of grouping, all of them aimed at getting greater efficiency

29. Jenkins, J.J., *Studies in Individual Differences*. New York, Appleton-Century-Crofts, 1961.

30. Stoddard, G.D., *The Dual Progress Plan*. New York, Harper Brothers, 1961.

into educational procedures. Only one form of grouping, namely ability grouping or streaming based upon tests of general ability, will be considered at this point.

The aim of ability grouping is to reduce the range of differences within a class and make it a more teachable unit. If one asks 'Did ability grouping in fact do this?' the answer would be 'Not much'. According to Goodlad and Anderson (1959), separating children into A and B groups on the basis of general ability reduces variability in school achievement by about 7 per cent and an ABC grouping reduces class variability by about 17 per cent. Again, when bright and slow children were separated from the average by removing children with I.Q.'s 120 and over and 90 and less, the remaining pupils exhibited a spread of attainment on reading tests ranging from grade medium 2.7 to grade medium 11.2 a range of 8.2 grades.

Although it is possible to cite only a few of the numerous studies available, the evidence shows quite clearly that there is no such thing as a homogeneous class. Those who support ability grouping do so in the belief that there is a high relationship between I.Q. scores and school achievement. In fact the correlations are only moderate. Also, those who support ability grouping apparently believe that there is a high correlation between the various cognitive achievements for each individual, that is, that the intra-individual correlations for the various school subjects are high, whereas in fact they are only moderate. The following figures form a study carried out by the Education Department of Western Australia involving a testing of 905 Grade 7 children with tests of reading and general intelligence will illustrate the point.

- (a) The I.Q.'s of Grade 7 pupils reading at Grade 7 level ranged from 70 to 130+.
- (b) The I.Q.'s of Grade 7 pupils reading at Grade 4 level ranged from less than 70 to 109.

Clearly other factors besides general intelligence contribute to achievement in reading. Also, streaming is apparently much less effective than was once thought and there is a need for a much more flexible form of grouping, as well as the necessity for attempts within by the wide variability in the ability and in the achievements of pupils.

Bassett commented that the practice of separating children into A, B and C classes within a grade has some dubious advantages and some clear disadvantages. Teachers believe that individual differences have been catered for organizationally and neglect them; in fact the practice encourages 'class' methods of teaching. Secondly, the attitudes in 'lower' groups are often unsatisfactory in that teachers frequently have a poor attitude to lower group children,

and lower group children often have poor attitudes towards themselves (negative self-feeling). Already in this report reference has been made to the notion that children 'learn how to learn', especially that they learn intelligent modes of behaviour. Pupils learn a lot from their fellow pupils, especially the modes of intelligent coping referred to but opportunity for this type of learning is limited if all the dull ones are put together. Every teacher knows that a straight C class is very heavy, whereas a mixture of some bright pupils 'levens the lump'.

Homogeneity of classes is a myth. We must expect, and accept, heterogeneity as the normal characteristic of any class and adopt organizational and instructional techniques to meet the problems posed.

Implications for Education

1. The present state of research evidence concerning mental abilities places considerable emphasis upon individual learning and experience as a component in intelligent behaviour with a corresponding tendency less to regard it as some fixed attribute innately determined. This also requires a modified view of maturation, regarding it less as a simple biological unfolding and more as particular stages in behaviour which are partly learned. Again, this means that there is less emphasis in present studies on 'ages-and-stages' type material. Earlier work attempted to formulate a sort of schedule or time-table stating the attributes and achievements of the child at each age level (Gesell and others), but the present trend is to regard such a time-table with more scepticism and the remark "It all depends". What the child can cope with at any one age level depends very much upon how well he has learned to cope at preceding age levels.

In the opinion of this writer this means that educationists have to rely upon organising work units, or sequences of work units, which have certain inherent characteristics which ensure their suitability to achieve the aims of education rather than relying upon 'age-stage' data. These work units should have a beginning point which is easy to grasp, they should be internally graded into small easy steps to ensure successful progression, they should be comprehensive in that they cover all types of difficulties from the learner's viewpoint and so bring out the points which are educationally significant, they should aim and be designed to secure maximum intrinsic interest, they should provide for both remediation and enrichment and they should be sequentially graded so that easy transition and progression occurs between, as well as within units.

Organization of material into sequential units applies particularly to the so-called skills, such as reading and arithmetic, but probably is also advantageous in the areas of social studies and

creative expression. It implies that the various syllabuses which together comprise the curriculum should be worked out at length, and in detail, and should in fact provide more help and guidance for teachers in regard to content and method.

Briefly this recommendation is that the syllabuses be based upon sequential units of work (in a subject like arithmetic possibly about 20 of them to cover the primary course) rather than organization in age-grade levels.

2. Piaget and others have claimed that mental development proceeds by a series of forward surges, followed by a period of consolidation, rather than by a steady increase. The syllabuses could be organised to reflect this characteristic. If a system of sequential units was adopted, remedial and enrichment material should be placed within particular units, or between particular units. Alternatively, if a grade system was adhered to then certain grades should be predominantly remediation and enrichment years. Possibly Grade 3 would be an appropriate remediation-enrichment point, with the emphasis on remedial reading, and Grade 7 another with the emphasis upon remedial arithmetic, transition work for secondary, and enrichment.

The recommendation is that remediation and enrichment should be 'written into' the curriculum so that these activities become recognised as something every teacher is expected and qualified to do.

3. Concerning organization the following points are made:

- (a) As the child's school performance is less dominated by general intelligence than was previously thought, the organization of groups for instructional purposes is probably more effective if based upon achievement in specific subject areas.
- (b) As there is considerable intra-individual variation in achievement level from one subject to another, the grouping should be flexible.
- (c) Streaming on the basis of general intelligence is probably less effective than was thought and leads teachers to think of pupils in terms of 'labels' e.g., bright, dull, etc.
- (d) Grouping is done to promote efficient attainment of the goals of education, and these include social participation and adjustment and expressive work as well as achievement in skills, the grouping should at times take recognition of the needs in these educational areas.

4. To an appreciable degree children learn to be intelligent. The school course should emphasise thinking and problem solving—

some of the problems being quite simple but the range of difficulty gradually increasing and all the problems intended to make the child think about the application of his learning.

Educationists should be slow to attribute poor forms of behaviour to a lack of intelligence. It is well first to look for a lack of information, a lack of skills and poor training in information processing.

5. From the study of individual differences the following points emerge:

- (a) The way in which children are taught in a class, not the method by which the class was formed, is the important thing.
- (b) Within a class the emphasis should be upon the 'pupil's learning' rather than upon the 'teacher's training'. This means that class teaching especially oral information lessons to class groups, should become less important, with a corresponding greater emphasis on individual assignments and small-group work, with class teaching occurring in those situations for which it is especially appropriate—such as where an audience is required.
- (c) The normal method in skill subjects should be to work individualized assignments with a greater deal of inner direction and proceeding at a rate appropriate to each learner. This implies that in skill subjects detailed 'programmes' to form the basis of individualized assignments are needed.
- (d) Enrichment and remedial work must be accepted as normal and necessary in every class.

HUMAN ABILITIES IN ACTION

Thinking

The word "thinking" is used to describe a number of rather differing processes. There is autistic thinking, which includes such activities as day dreaming and idle fantasies; there is imaginative thinking; there is the thinking which expresses belief as in "What I think about so-and-so", and the thinking which is remembering as in, "I can't think where I saw that man before". Finally there is the thinking, pondering, which is reasoning, reflecting, problem-solving, and it is in this sense that the word will be used in these pages.

Psychological studies have shown that when learning is of the kind that emphasises the acquisition of facts or the memorizing of material, then material thus learned is quickly forgotten. Evidence

on this point is presented in the section on recall and remembering but it might be worth repeating that in general, approximately one-half of factual material learned is lost within one year. This evidence supports the view, which is believed to be the current viewpoint that a change in emphasis is called for. Such a change should be away from simple direct factual learning which is basically memorizing and towards an emphasis on doing and thinking, on using facts to learn from, on achieving understanding and insight from manipulation of the facts rather than the memorizing of the facts themselves. Briefly, this could be described as an emphasis on thinking rather than on memory, and accordingly this section on thinking is presented to clarify what is meant by the term and to show how thinking integrates with other activities included under the broad heading of learning.

Recent publications on thinking have been made by Bartlett,³¹ Vinacke,³² Harlow (1949), Bruner, Goodnow and Austin³³ Osgood,³⁴ Ryle,³⁵ Mower,³⁶ Thomson,³⁷ and Bruner (1956). Studies dealing with the related topics of concept formation and problem solving could also be considered at the same time and these include Chase,³⁸ Kendler and Kendler,³⁹ and Lovell.⁴⁰ Finally Piaget's publications dealing with the thought of the child are relevant, although they have been considered more fully in another section.

The works of Bartlett (1958) and of Bruner *et al* (1956) are considered to be the main studies of an original kind and that of Thomson (1959) a lucid exposition and summary of the recent literature. Thomson makes the following points (based on a summary of problem solving in animals):

- (a) Some problems can be solved by using habitual responses already established.

31. Bartlett, F., *Thinking: An Experimental and Social Study*, London, Allen and Unwin, 1958.
32. Vinacke, W.E., *The Psychology of Thinking*, New York, McGraw-Hill, 1952.
33. Bruner, J., Goodnow, J. and Austin, G., *A Study of Thinking*. New York, Wiley, 1956.
34. Osgood, C.E., *Method and Theory in Experimental Psychology*, New York, Oxford University Press, 1953.
35. Ryle, G., "Freedom, 'Language and Reality.'" *Proceedings. Soc.*, 1951, Supp. Vol. 25.
36. Mower, O.H.A., "Psychologist Looks at Language." *Am. Psychol.*, 1954, 9, 961-964.
37. Thomson, R., *The Psychology of Thinking*, Pelican, 1959.
38. Chase, C., "An Application of Levels of Concept Formation to Measurement of Vocabulary" *J. Educ. Res.*, 1961, 55, 75-78.
39. Kendler, H.H., and Kendler, T.S., Vertical and Horizontal Processes in Problem Solving." *Psychol. Rev.*, 1962, 69, 1-6.
40. Lovell, K., *The Growth of Basic Mathematical and Scientific Concepts in Children*, University of London Press, London, 1961.

- (b) Adaptive behaviour is largely explicable from a knowledge of the past experience. It is either learning something new or adapting former learning to a slightly different problem.
- (c) There must be motivation (need or drive) for the problem to be even recognised and then solved. Both learning and motivation are probably crucial in problem solving.
- (d) Individual characteristic patterns of behaviour are repeated for each problem solver in different situations, such as reliance on trial and error or the occurrence of insights.

It is suggested that problem solving in children has features in common with those which characterize the experimental animal studies.

Bartlett (1958) makes a highly original and significant contribution to our understanding of thinking. Bartlett maintains:

- (a) That thinking is a complex high level skill in which words, symbols, shapes, colours, etc., supplement, or take the place of bodily movements.
- (b) That essentially the thinker is trying to 'fill up the gaps' in the information that is available to him, and in addition the thinker tries to do this in such a manner that there is a high probability that all other thinkers, given the same incomplete information, will agree with him.
- (c) How he does this, and the conditions under which he does it, are considered and illustrated for formal thinking, the thinking of the experimental scientist, the thinking of the artist and everyday thinking.
- (d) Many of the processes used in thinking have been developed at the level of bodily skill (compare Piaget). Thinking also is characterised by rules peculiar to the field of information in which the thinker operates.

Concerning the nature of a skill Bartlett maintains that physical skills and, by analogy, thinking, have a characteristic of many receptor and effector functions being interlinked and related within an order of significant succession. This implies the great importance of timing of the unit or habits which in their combination comprise a skill or comprise thought. In addition there is the characteristic of the direction towards a particular goal or purpose, and the terminus when the goal is reached the sequence stops.

Bartlett discusses at some length, and considers evidence from experimental studies of thinking within closed and within open systems. This is the clearest example of gap filling or interpolation.

In a closed system there are a limited number of units (terms of members) which do not change as the thinking proceeds, and are theoretically definable before they come to be used. The range of the gap and the number and order of the steps are important. The following 'pointers' concerning thinking in a closed system are suggested by Bartlett:

- (a) The number of ways in which gaps are filled is usually much fewer than the ways in which, theoretically, they could be filled.
- (b) The way in which a gap is filled depends principally upon the amount of information (items) given. Below a certain minimal amount nobody can fill the gap, and at a certain maximum no normal person can fail to fill the gap.
- (c) If uniform procedures in gap-filling are required an increase in the number of directions is necessary, and this amount of information varies with the number of dimensions in which the system concerned is simultaneously varying.
- (d) There may be objectively determined uniformity in the number of steps, or in order of steps, or in both, and one way of securing this is by instruction.
- (e) Once the manner of gap filling is selected every step normally increases the probability of some specific subsequent step, and a stage is reached when all steps are completely determined.
- (f) Intelligence may be related to the amount of information (items) required to achieve gap filling. The most intelligent may be those who with the smallest amount of information produce that for which others need more information.

Thinking in open system (extrapolation) is more complex in that there is usually a greater range of the number of ways in which completion can be achieved. One way, and the most characteristic, is to make an intuitive leap to some terminal or sub-terminal point. This reduces extrapolation to interpolation and converts open systems thinking to close systems thinking. If closure following a particular leap proves impossible, then some other hypothesis or leap is tried until closure is achieved.

In thinking the thinker ventures beyond the information given and the way he does this involves response to directions given and the use of rules and conventions, both of which processes are basic in thinking. In thinking one must be able to draw upon information previously acquired, and upon responses already established. For these reasons it is justifiably called a high-level response closely integrated with simpler forms of learning such as retention, transfer,

and recall; and although it cooperates with environmental stimulation it goes beyond stimulation. Much thinking is of the nature of dealing with evidence which is given in 'disguised' form and this comes very close to what has traditionally been called problem-solving.

Ryle (1951) maintains a position in harmony with that taken by Bartlett, Thomson, and others, when he claims that thinking is largely a matter of 'drills and skills' partly acquisition and partly performance of what he has been previously acquiring. When we have skills we can think, just as when we have skills we can multiply.

Kendler and Kendler (1962) have published an interesting article on 'vertical and horizontal processes in problem-solving'. The words vertical and horizontal refer to two important characteristics of thinking which they represent on the basis of a modified stimulus-response (S-R) model, the modification being the postulation of mediating responses and stimuli (s and r) between S and R to give S (r-s)-R. The word 'vertical' refers to the assumption that in problem-solving independent levels of behaviour occur simultaneously, and the word 'horizontal' to the conception that behaviour is a continuous process against the dimension of time. These two important characteristics of thinking could be represented in S-R form as follows:

Horizontal

V	S1	r	s	R1	r	s	R1
	S2	r	s	R2	r	s	R2
e	S3	r	s	R3	r	s	R3
r	S4	r	s	R4	r	s	R4
t	S5	r	s	R5	r	s	R5
i	S6	r	s	R6	r	s	R6
c							
a							

- 1 S1, 2, 3, etc., s=Cues given in sensory impression
 r=mediating responses-typical inner muscular or glandular reactions evoking.
 s=mediating stimuli, the self-stimulation evoked by r.
 R1, 2, 3, r=Overt responses, actual or potential.

It will be appropriate to end this section on thinking with a quotation from Thomson (1959, p. 109).

"... In a narrow sense the word learning can be contrasted with 'reasoning' or 'thinking': in a broader sense of the term it can

be maintained that reasoning is merely a complicated form of learning. There is a continuous development from simple learning operation to the application and modification of prior learning, in a problem-solving situation, which is a kind of 'thinking'."

Creative Intelligence

A brief review of some recent and important studies on creative intelligence is included here as the topic is closely related to that of mental abilities which has been discussed, and to thinking and learning, which follows. Reference will be made to the work of Bartlett (1951), Vinacke (1952), and Guilford 1959 (b), and while Vinacke and Guilford have a good deal to say about the measurement of creative abilities, this review will be concerned more with the nature, educational importance, and promotion of creativeness. Some persons who have studied creativeness have followed an 'artistic' approach and others a 'scientific' approach. This review will concern itself only with scientific studies of creativeness.

Bartlett (1958) claims that artistic thinking is essentially a 'gap filling' process, and in this it resembles the creative thinking of the mathematician and the scientist, except that it proceeds in a different manner. Both artistic thought and scientific thought seek the universality of a system closed of all imperfections (gaps), but while the scientist and mathematician accept the necessity of proof, the artist seeks to show us perfection, without elaborating the intermediate steps. By contrast everyday unskilled thinking seeks simply to convince by strong assertion.

Guilford (1959) analysed primary traits related to creativity and found :

- (a) an ability to 'see' problems or a generalized sensitivity to problems.
- (b) fluency factors related to the fertility of ideas which included word fluency, associational fluency, expressional fluency and ideational fluency.
- (c) flexibility, in that creative thinkers are ready to strike out in new directions and these are of two types, namely, spontaneous flexibility (or freedom from inertia, preservation, functional rigidity, etc.) and adaptive flexibility (as seen in novel solutions to problems, and in clever, remote and unusual responses to situations).

Vinacke (1952) relates creativeness to the personality of the individual and believes that the problem of spontaneity has considerable bearing upon creative ability which may be of an artistic, or of a non-artistic kind. The creative situation combines realistic and imaginative thinking and some of the characteristics

of problem-solving fantasy. Over-conformity, over strictness, over-emphasis on the accumulation of factual information, over-emphasis on 'drills', insecurity dependency, and lack of self-reliance reduce creativeness.

Creativeness is not the prerogative of any one age group, intelligence level group, or subject group. Young children may seem to be more creative in that they are less tutored and less inhibited, than some older persons who have been miseducated exhibit signs of over-discipline, stereo-type in thought, and over-conforming, but if education proceeds upon lines to preserve and promote creativeness there is every reason to predict increased creativity with age. Children of high intelligence are commonly thought of as being more creative, but statistical studies show almost zero correlation between measured I.Q. and creative productivity, and moreover, creativity as conceived here includes quite modest and humble contributions of which even dull children are capable. Certain subject groups, particularly the artistic ones, are commonly thought of as the province of creativity, but as conceived here creativeness runs through every school activity as an attribute of the way in which the subject is conceptualized and taught. Subjects like arithmetic, science and physical education can and should be as much oriented to creativity as are subjects such as art and creative writing.

Creativeness can be thought of as akin to thinking and problem solving in that every problem situation calls for some originality which may range from a slightly rearrangement or modification of familiar material to bold and almost completely new conceptions. Throughout this report thinking and problem-solving will be stressed as desirable attributes of a primary curriculum and it follows that creativeness likewise will be regarded also as a desirable attribute for the reasons that it places the learner in the most favourable relationship to his material, it makes for meaningfulness and significance of the learning process, it makes for a high degree of transfer between school and social situations and it keeps the child in contact with real problems.

The conditions which are considered to promote creativity, or by their absence to inhibit it, are as follows:

- (a) Content material which makes for creativity lies within the conceptual ability of the child. (In the absence of more precise definition and classification of the concept involved the difficulty level of the language demanded by the material may be taken as indicating difficulty level. If the subject can be expressed in language appropriate to the age level, it can be for the time being assumed that conceptually, it can be handled by the child.) Material which is too difficult, and too verbal, decreases creativity.

- (b) Material which lends itself to being manipulated, preferably not only in the physical sense but also in the 'mental' sense, makes for creativity. Material which can be presented in concrete form e.g., science or nature study material lends itself well to this purpose, while material which is merely verbal is less suitable.
- (c) Material should be related to the everyday needs, interests, and activities of the child. It should arise from real life situations.
- (d) Overemphasis on drill, memory work, simple repetition of skills, over discipline, excessive direction, and conformity reduce creativeness.
- (e) Where the school day is programmed in short periods (15 to 20) minutes creativity can hardly flourish. Creative work often requires longer periods of time to initiate and carry through lines of action.
- (f) Excessive time-stress upon a child reduces creativity which often calls for an unhurried tempo in the day's affairs.
- (g) Some sort of balance is needed between input and output—between impression and expression. The child must come in contact with problem situations (i.e., stimulations of an intellectual kind) and there must be interaction or feedback between the problem situation and the child's creative productions aimed at its solution, which, if successful, terminates the problem situation
- (h) Emphasis on creative work implies an appropriate set of standards by which the child's productions are to be judged (rewarded). This involves respect for the child's efforts, a flexibility in our judgments, and possibly a departure from the traditional, fussy and pedantic attitude of many teachers with an unreasonable demand upon neat work.
- (i) Subject-matter which is verbal-conceptual, which cannot be expressed and presented in tangible concrete form or in practical activities, is more appropriate to the later levels of education. In the Piagetian sense much of literature, grammar, and history are quite 'mature', more mature than some branches of science.
- (j) Priority should be given to content material and to activities which foster and promote creativity—particularly content which is capable of being 'manipulated' and to activities which are related to current needs and which avoids 'time-stress'.

The Work of Piaget

In recent years, mainly due to the influence of Piaget, there has been considerable attention given to the study of how the child thinks. The testing movement concerned itself with the end-products of thought, as represented for example in the I.Q., but did not concern itself with how, or why, the child came to give the responses which were classified as intelligent, or as unintelligent, forms of behaviour.

Piaget has outlined a sequence in the development of the child's scientific and logical thought which reveals how children at various levels cope with problems of this type. The sequence is divided into stages which are given fairly precise age limits. There have been many replication studies, e.g., Lovell and Ogilvie,⁴¹ Elkind,⁴² King, Case and Collinson (1962), Biggs 1959 (a), 1959 (b), Dodwell⁴³ which have tended to confirm Piaget's findings, with some qualifications, mainly concerning overlap of the stages and the relevance of previous experience.

The Piagetian stages are (a) the sensori-motor stage, (b) the stage of concrete operations which contains a preceptual phase, an intuitive phase and a phase of concrete operations, and (c) a stage of formal operations. The best known source material, besides of course, the translations of his books are Berlyne⁴⁴ and Hunt.

1. *The Sensori-Motor Stage.* Approximately the first two years of life, the child deals directly with objects and because he lacks language, or has insufficient language to substitute words for actions, he is object-tied. He is also object-tied in the sense that objects not present do not exist for him. He is sense-tied in that sense impressions dominate thought. The memory span is very limited in that he can cope with only one object, or attribute of an object, at a time. Towards the end of this stage the origins of symbolic processes can be observed.

41. Lovell, K., and Ogilvie, E.A., "Study of the Conservation of Substance in the Junior School Child." *Brit. J. Educ. Psychol.*, 1960, 30, 109-118; "A Study of the Conservation of Weight in the Junior School Child." *Brit. J. Educ. Psychol.*, 1961, 31, 138-144.
42. Elkind, D., "The Development of Quantitative Thinking: A Systematic Replication of Piaget's Studies." *J. Genet. Psychol.* 1961 (a), 98, 37-96; "Children's Discovery of the Conservation of Mass Weight, and Volume: Piaget Replication Study II." *J. Genet. Psychol.*, 1961 (b) 891, 217-227; "The Development of Additive Composition of Classes in the Child." Piaget Replication Study-III. *J. Genet. Psychol.*, 1961 (c), 99, 51-57. "Children's Conception of Right and Left: Piaget Replication Study IV. *J. Genet. Psychol.* 1961 (d), 99, 269-276.
43. Dodwell, P., "Children's Understanding of Number Concepts: Characteristics of an Individual and of a Group Test." *Canad. J. Psychol.*, 1961, 15, 29-38.
44. Berlyne, D., "Recent Developments in Piaget's Work." *Crit. J. Educ.* 1957, 26, 1-12.

2. *The Stage of Concrete Operations.* (a) The preconceptual phase : Approximately 2-4 years. The child learns on a conceptual level some of the lessons he has already learned on the sensory-motor level. Activities are dominated by learning language and by symbolic play.

(b) *The intuitive phase.* Approximately 4-7 to 8 years.* The child's thinking is still dominated by perceptions; he is gradually becoming decentred in his thinking; he focuses on one aspect of a problem and overlooks others because *centring* causes one element to be overemphasised.

(c) *The phase of concrete operations.* Approximately 7-11 years. Thoughts are more decentred from perceptions and actions, and because there is greater dominance of central processes there are greater differentiations and coordinations. In the words of Berlyne (1957, p. 7.) :

"Logical (or, as Piaget calls it 'operational') thought emerges when a certain basic stock of concepts has been acquired and when

* The following abbreviated report of a study by Elkind (1961) will serve to give the reader an example of the type of experiment carried out by Piaget and his followers.

Abstract thought depends, in part, upon the ability to compose classes and sub-classes, within a total class. The ability of children of various ages to do, is reflected in the 'beads' experiment. A child is shown a box of brown wooden beads and a box of less numerous white wooden beads. After he has agreed that all the beads, are wooden, he is asked, Are there more wooden beads, or more brown beads, in the two boxes ?

(In a replication study based upon this experiment the following variation of procedure was followed. Children aged 5, 6, 7, 8, (four groups each of 25 with average I.Q. 109) were seen individually and questioned as follows:

- (a) How many children are there in your class ?
- (b) How many boys are there in the class ?
- (c) Are there more boys (if subject is a girl the word girl is used throughout), or more children in your class ?

The results of the beads experiments indicate that there are three age-related stages.

- (a) The first, approximately 4-5 years, in which the children had a general impression of total class and indicated that they knew the wooden beads were both brown and white. When forced to break down this impression and compare part against whole, the children behaved as if the whole class was destroyed, and compared one partial class against the other partial class (brown and white).
- (b) At the second stage, usually 5-6 years, the children had a more differentiated conception of the general class and its sub-classes.
- (c) At the third stage, usually 7-8 years the children had an abstract conception of classes and said immediately that the wooden beads were more than the brown beads because there were white wooden beads as well.

these concepts have been organised into coherent systems. The concepts which figure in operational thought are called 'operation' because they are internalized responses. They grow out of certain overt actions in exactly the same way as images grow out of imitation." Berlyne goes on to say that three sorts of operation are of particular importance; namely, classification (classes), ordering (relations) and grouping—which includes both classification and ordering (numbers).

Taking an over-view of the stage of concrete operations we see that the child became less object-tied as he learned operations, to free his thinking from the dominance of perception. He learns the constancy of conservation of objects, mass (7-8 years), weight (9-10 years), and volume (11-12), and his span of apprehension is increased so that he can deal with more attributes of an object or situation simultaneously (probably 4). Thought processes are reversible, unlike deeds, and he is learning that they can be reversed, or obliterated or cancelled, giving thought far greater flexibility than action. He becomes less ego-centric, is decentred in his thinking, and takes a more objective conception of the world. During this stage, which corresponds very closely to the primary school years, the child achieves methods of dealing with problems, mainly by performing operations with objects by handling and manipulating them to carry out processes analogous to reasoning processes so that he can arrive at logical conclusions with certainty. The child acquires the ability to classify—including composing and decomposing of classes—to order, and to group. During this stage concrete operations form the basis of his thought processes, and learning to master thinking in concrete terms, paves the way for the more abstract stage that follows.

3. The Stage of Formal Operations: Approximately 12+ years. At this stage physical processes (actions) become mental structures. The child can now think in terms of propositions and deal with propositions instead of objects. He begins to enumerate, order, and classify in verbal propositions and deal with the sum total of possibilities rather than the mere empirical situation. He takes the final steps towards complete decentring (he can think impersonally unrestricted by personal wishes and emotions—but of course he may not) and versatility in thought. He can concern himself with form of an argument irrespective of its empirical content, construct a rational 'as-if' world, setting up hypotheses and deducting consequences. He is liberated from the bonds of the concrete.

Equilibrium. Some mention should be made of the concepts of assimilation, accommodation and equilibrium which apply generally and not only to any of the stages. Intelligent behaviour, which is seen as a form of adaptation, is an interplay of assimilation, as when the learner takes in or uses something from the environment, and accommodation, in which the learner alters old activities and concepts, or develops new ones, in response to the impact of the

environment. Possibly of greater importance is the concept of equilibrium. This concept could be interpreted to mean that the child should achieve mastery at one level before making what could be described as a forward leap towards a new level. It conceives mental progression as a series of forward drives each followed by a period of consolidation, in which the child seeks to achieve mastery of the concepts and skills implied in his recent advancement. The best way to facilitate the coming of the next stage is to help the child to achieve mastery (equilibrium) in the present one. Educationally it would mean the progress is not one steady uphill pull but a series of steep rises, each followed by a comparatively easy section.

While Piaget's stages aim to show the sequence in the development of thought, it is also probably true to say that they correspond to the sequence by which adolescents, or even adults, learn to cope with problem situations in which they have no background of experience.

Implications for Education

1. The content of the curriculum should be such as to promote activity, particularly the activity of thinking.
2. Material which implies passive learning consisting of little more than memorizing is of limited value.
3. The necessity for the primary curriculum to consist essentially of content which lends itself to practical demonstration and manipulation.
4. The necessity for children to have extensive first-hand experience with concrete materials—actually to handle and to manipulate equipment in building up understandings.
5. The necessity for the child to arrive at understanding rather than merely to accept some one else's verbal explanation.
6. True understanding should always precede verbalization. There is a danger that if children parrot rules before they really understand, then true understanding may be made more difficult or even impossible. (The danger that children have too many words and too few understandings.)
7. Probably it is impossible to teach understandings directly—they come from experience of the concrete practical stages involved in manipulating equipment.
8. Learning to think is essentially learning to solve problems—first concrete problems and then conceptual—verbal problems.

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PERSONALITY

THE term personality actually comes from the Latin word "persona" which means masks used by actors on the stage, but personality in the modern usage of the term means the real individual and not the disguised individual.

Personality covers the whole nature of the individual and is therefore difficult to define. Psychology does not regard personality as a passive entity but as that dynamic character of the individual which finds expression through his conduct and activities. It does not enquire into what personality is but into what it does. So considered, to put it in the words of Woodworth,¹ personality means "the total quality of an individual's behaviour." Personality is not however, a mere aggregate but is the unity or integration of manifold manifestations like pleasure, love, hate, activity, inactivity and hope-despair of the individual.

Various Definitions of Personality

Watson agrees with Woodworth in recognising the dynamic nature of personality. According to him personality consists of the organism's responses to stimuli in its adaptation with an environment through the medium of nervous system. Watson ignores mental unity and emphasises nervous pattern or organisation consisting of stimulus response units. Other psychologists like McDougall, Morton Prince and Gordon W. Allport also agree with Woodworth in laying stress on the dynamic character of personality. McDougall regards personality as number of instinctive activities. In his own words, personality is the balance or harmony of two contradictory impulses: (i) submission or self-abasement; and (ii) mastery or self-assertion. Thus their conflict gives rise to various disorders of personality. Morton Prince also regards personality as consisting of instinctive tendencies or impulses. Allport came to the conclusion that personality is the unity of those qualities of the individual which

1. Woodworth and Marquis, *Psychology*, Ch. 4 and 5.

enable him to exert influence upon other individuals. Stout thinks that personality means the embodied mind. According to him the mind acts in various ways through bodily organism as its medium.

In conclusion, we may say that personality is not a mere entity nor is it a mere collection or aggregate of a number of activities or qualities, but the unity of them all.² By personality is meant the individual's physical and mental pattern with the help of which he acts. Personality is the total quality of an individual due to bodily pattern, mental integration and chemistry of internal functions. It will be in the fitness of things to mention here that Allport identified 50 different meanings of the term. He points out that two opposing viewpoints emerge in the description of personality: (i) Mask approach; (ii) Substance approach. In the mask approach, authors have emphasised the superficial aspects of human behaviour and have thus laid emphasis on outward appearance. The other class, i.e., substance approach has provided definitions which centre around the underlying nature of the person and which emphasises the basic determinants of the behaviour pattern.

VARIOUS APPROACHES TO PERSONALITY

Early Approach

Those of Freud's contemporaries, who left their imprint on the understanding of abnormal behaviour, were Janet, Morton Prince and Pavlov. Janet offered the explanation that there must exist a level of psychological tension for proper unification and integration of mental phenomenon. He believed that the reduction in the energy level weakens the capacity of the individual to synthesise and that, as a result, systems of ideas and feelings are dissociated from the total personality. Janet recognised two principal types of neurosis: psychasthenia and hysteria. Treatments, guided by the aforementioned tension level theory, consisted of helping the patient to reintegrate the dissociated elements. Prince was one of the first to recognise the importance of association and conditioning in the causation of psychoneurosis. He employed hypnosis and automatic writing as treatment methods. Pavlov evolved the concept of conditioning as a form of learning. His work served as a stimulus for the emergence of the behaviouristic school of psychological thought. The core of Pavlov's theory of personality foundation through conditioning lies in his attempt to explain sleep and hypnosis as being the result of the spread of inhibitory influences over the excitation and cerebral context. The conflict between the neural area of the inhibition was regarded by Pavlov as the precipitating factor in the development of neurosis.

2. Bhattacharya, P.N., *A Textbook of Psychology*, pp. 165-169.

Psychoanalytic Approach

Freud³ developed the psychoanalytical approach for the understanding of personality and its development. Early disciples of Freud soon developed divergent theories.

The basic ideas in Freud's concept of personality formation and structure grew directly out of his experience in the treatment of neurotic patients. He recognised that many of the attitudes and feelings expressed by his patients could not come from consciousness and, therefore, must reside in the levels below consciousness. For convenience of presentation, the Freudian approach to personality is discussed in the following paragraphs:

Freud observed that the verbal production of many of his patients would come from the unconscious. He divided mental activity into three levels: conscious, preconscious and unconscious. The conscious includes the overt thinking. The preconscious of memories can be recalled with some difficulty. The unconscious contains attitudes, feelings and ideas that are not subject to voluntary control. Motivation, Freud believed came from a general biological energy, and contained constructive and destructive urges. The motivation for man's activities is guided by two principles: the pleasure principle and the reality principle.

Personality according to Freudian theory, is formed on the basis of conflict. Conflicts may be evoked between pleasure seeking and reality, love and hate, and passivity and activity. Growth towards maturity is dependent on the individual's success in resolving these conflicts.

Three principal stages are described by Freud in his theory of the psycho-sexual development of the individual. These stages are: the infantile stage which further includes the oral, the anal and the phallic; the latent stage and the genital stage. Freud explained the personality structure in three components: the id, the ego, and the super ego. The id is thought of as the main source of the biological energy that expresses itself in the life and death urges. The ego is the 'me', 'self' in which the individual differentiates himself from his surroundings and through which the integrative core of the personality is formed. Super ego develops as the ego internalises social and cultural norms.

Adler, after departing from Freud, developed his school of Individual Psychology. His Psychology emphasised the will to power, the inferiority complex and style of life. According to Adler, the main goals of personality are social adaptation and the attainment of power. Development of neurosis is due to fear of inferiority feelings.

3. Freud, S., *An Outline of Psychoanalysis*, New York, W.W. Norton and Co., Inc., 1949.

Jungian school of Analytic Psychology mainly emphasised collective unconscious and archetypes. Jung has introduced the concept of introversion-extroversion in personality types. He has introduced the word association test to study the significant conflicts of an individual.

Other psychologists like Rank, Fromm, Horney, Sullivan, Reik and Alexander and French have also advocated their own systems of psychology.

Cultural Approach⁴

The cultural dimension of personality is an important aspect that needs consideration. Certain regularities of behaviour, which are characteristic of a certain cultural system, are absorbed in the conduct of an individual. Those who share a common culture, display certain common modes of behaviour. This is often referred to as cultural character. However, it is essential to distinguish those regularities which may be ascribed to social inheritance as distinguished from those which may be referred to an individual's innate characteristics, called temperament or constitution.

Some individuals consider personality culturally from another point of view. They do not ask for the regularities which characterise every person who shares the culture, but ask rather what provisions the culture makes for the development of maximisation or minimisation of differences. So culture does not merely provide for the uniformities in the behaviour of those who share a common culture but also for individual differences. The extent to which differences in life history experience become significant in the life of an individual has a cultural component.

Different methods have been developed for studying personality in culture. Three methods of interest are: (1) the life history approach; (2) the observational cross-section approach; and (3) the projective tests. Each method has given valuable information on the genesis of personality under different cultural set-ups.

Eclectic Theory of Personality Organisation

There are many eclectic theories of personality organisation. We have selected Murray's approach as representing one of the more comprehensive and influential of these theories. In his theory of personality description and prediction, Murray has drawn most heavily on psycho-analytic and Gestalt principles.

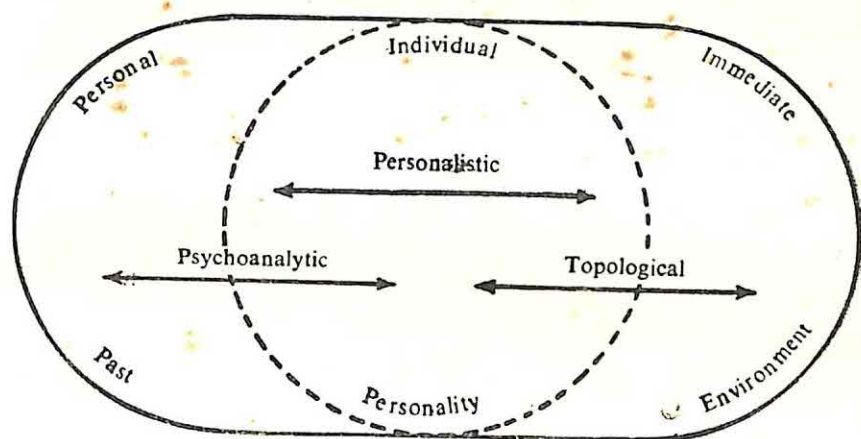
Murray has conceived of personality as consisting of an integrate aggregate of *needs* and *perceptual press* (see Fig. 1). Needs are defined as what the subject requires to reduce striving behaviour.

4. Linton, R., *Cultural Background of Personality*, New York, Appleton-Century Co., Inc., 1945.

Murray's list of manifest and latent needs covers a host of social as well as personal need-situations. The frequency and the intensity of these various needs define a principle component of an individual's personality organisation. A press of an object of person is defined as what it can do to or for an individual personality, i.e., the power it has to affect the well-being of an individual. It may be noted that needs and press are functionally related, for environmental press are often interpreted by the individual on the basis of current needs.

In Murray's theory the behaviour resolution of a particular complex of need-press is called a thema. A thema is the dynamic structure of an event, i.e., the general nature of the environment and the individual's response. According to the theory, one can infer the general nature of an individual's needs and perceived press by analysing a large variety of his thematic tendencies. These thematic tendencies are most revealing when the individual feels no need to cover up his 'real' needs and perceptions.

In order to secure this less biased type of information Murray developed the Thematic Apperception Test, a series of ambiguous pictures about people in various situations. According to the psychoanalytic dynamisms of identification and projection, the individual is assumed to identify with one of the characters in a picture, and then project his own needs and press perceptions into his description of the behaviour and feelings of the picture-character (Murray, See Fig. 1).



<i>Pro— tagonist— Derivation</i>	MURRAY PSYCHOANALYTIC	ALLPORT— PERSONALISTIC	LEWIN— GESTALT
<i>Objectives</i>	Reconstruction of past life experience to explain present organization : thematic biography.	Present organization of the individual personality—as distinguished from other personalities : unique psychograph.	Establishment of general laws of organization within the current behavioral “fed”: $B = P \times E$
<i>Methods of Study</i>	Free association and dream analysis : apperceptive tests of fantasy. The case history method.	Personlity tests, judgments and ratings. Inter-correlations of expressive movements by statistical procedures.	Controlled environmental manipulation of experiment.
<i>Leading Concepts</i>	Need, press, thema ; libido-theory, complex. Ego-defence mechanisms and symptoms; the unconscious. Personal-biography as Gestalt.	Trait : congruence and consistency. Functional autonomy. Uniqueness of the individual ; individual personality structure as Gestalt.	Vector, valence, quasi-need; life space, boundary, barrier (topology). Contemporaneous motivation. Uniqueness of individual Gestalt.

FIGURE 1

Rosenzweig's (81) notion of a convergence of theoretical approaches to personality study among a limited number of investigators. "...Allport emphasises the personality as it now appears within its own boundaries, Murray queries how it got that way from past experience, and Lewin studies its interaction with the present environment."

'We favour Murray's approach to personality theory because it borrows liberally from Freud's best thinking, and because it admits the possibility of more than one valid data-gathering procedure. Theoretically, such an approach might be able to synthesize the contributions of the available personality theories. It has already been responsible for the development of some of our more fruitful instruments for describing individual differences in personality organisation e.g., the Thematic Apperception Test, and the standardised

stress situation. It shows promise of improving our predictions of individual behaviour sequences under known environmental conditions. Murray's theory supplies much of the operational precision that is so woefully lacking in Freud's formulations, yet it retains most of Freud's dynamic principles. In our opinion, it is a most promising approach to personality description and prediction.

Table 1

Aggregate of Needs*

- | | |
|-----------------------------|--------------------------------|
| 1. <i>Positive Cathexis</i> | b. n Aff : Kindness |
| Supra : | c. n Def : Devotion |
| a. Mother | |
| b. Female | 5. <i>n Succorance</i> |
| c. Father | |
| d. Maec | a. Crying |
| e. Brother | b. n Aff : Dependence |
| f. Sister | c. n Harm: Appealance |
| Infra : | |
| g. Brother | 6. <i>n Harmavoidance</i> |
| h. Sister | |
| i. Contemporary | a. Timidity |
| j. Animal | b. n Suc : Appealance |
| k. Possessions. | c. n Nightmares |
| | d. Fears : |
| 2. <i>n Affiliation</i> | i. Insup, Heights and Falling |
| | ii. Water |
| a. Friendliness | iii. Darkness |
| b. n Suc : Dependence | iv. Fire |
| c. n Def : Respect | v. Isolation |
| d. n Nur : Kindness | vi. Assault, Lightning |
| | vii. Assault, Animals |
| 3. <i>n Deference</i> | viii. Assault, Human Hostility |
| | Father |
| a. n Blam : Compliance | Mother |
| b. n Aff : Respect | Contemporaries |
| c. n Nur : Devotion | ix. Illness and Death |
| d. Ego Ideal, Emulsion | x. Miscellaneous. |
| e. Suggestibility. | 7. <i>n Infavoidance</i> |
| 4. <i>n Nurturance</i> | |
| a. Sympathy and Aid | a. Narcisensitivity |

*(From *Explorations in Personality*, by Henry A. Murray, Oxford University Press).

- b. Shyness of Competition
- c. Avoidance of Competition
- id, Inferiority Feelings
 - i. General
 - i. Physical
- iii. Social
- iv. Intellectual

8. *n Blamavoidance and Super-ego*

- a. Sensitivity to Blame
- b. n Def : Compliance
- c. n Aba : Shame and Self-depreciation
- d. Directive Super ego
- e. Religious Inclination

9. *n Abasement*

- a. n Blam : Blame-acceptance
- b. n Def : Subservience
- c. n Harm or n Inf : Surrender

10. *n Passivity*

- a. n Inactivity
- b. n Aba : Acceptance

11. *n Seclusion*

- a. Isolation
- b. Reticence
- c. Inf. Shyness

12. *n Inviolacy*

- a. n Dfd : Vindication
- b. n Ach : Restriving
- c. Agg : Retaliation
- d. n Auto : Resistance

13. *Negative Cathexis*

Supra : a Mother

- b. Female
- c. Father

- d. Male
- e. Brother
- f. Sister
- g. Contemporaries
- Infra : h. Brother
- i. Sister

14. *n Aggression*

- a. Temper
- b. Combativeness
- c. Sadism
- d. n Dom : Coercion
- e. n Auto : Rebellion
- f. n Suc : Plaintance
- g. Destruction

15. *n Autonomy*

- a. Freedom
- b. Defiance
- c. Inv : Resistance
- d. n Ach : Independence

15. *n Dominance*

- a. Leadership
- b. Inducement
- c. n Agg : Coercion

17. *n Rejection*

- a. Hypercriticalness
- b. n Inf : Narcisensitivity
- c. n Sec : Inaccessibility

18. *n Noxavoidance*

- a. Hypersensitivity, Gen.
- b. Food

19. *n Achievement*

- a. General
- b. Physical
- c. Intellectual
- d. Caste

- e. Rivalry
 - f. Ego Ideal
 - g. n Inv : Restriving
 - h. n Auto : Independence
20. *n Recognition*
- a. Recitals of Superiority
 - b. Cathexis of Praise
 - c. n Exh : Public Performance
21. *n Exhibition*
- a. n Rec : Public Performance
 - b. n Sex : Exhibitionism
22. *n Sex*
- a. Masturbation
 - b. Precocious heterosexuality
 - c. Homosexuality
 - d. Bisexuality
23. *n Acquisition*
- a. Greediness
 - b. Stealing
 - c. Gambling
24. *n Cognizance*
- a. Curiosity, General
 - b. Experimentation
 - c. Intellectual
 - d. Sexual, Birth
 - e. Genitals
25. *n Construction*
- a. Mechanical
- b. Aesthetic
26. *n Order*
- a. Cleanliness
 - b. Orderliness
 - c. Finickiness about Details
27. *n Retention*
- a. Collectance
 - b. Conservance
28. *n Activity*
- a. Physical
 - b. Verbal
29. *Intensity*
30. *Emotionality*
31. *Persistence*
32. *Sameness*
- a. Constancy of Cathexis
 - b. Behavioural Rigidity
 - c. Mental Rigidity
33. *Inhibition*
34. *Elation*
35. *Imaginability*
36. *Deceit*

Factors of Personality

There are various factors which enter into the structure and functions of personality. Personality is influenced by : (1) Physical factor; (2) Chemical factor; (3) Glandular factor; (4) Social factor; and (5) Heredity factor,

1. *Physical Factor*: A physical factor of personality is the individual's physique. An individual's personality differs according to his physique. Tall and fair persons enjoy an advantage over their short and ugly associates. A bodily defect or deformity may, again, alter the whole personality. A blind man has to depend upon another person. A stutterer's speech is affected by his handicap. Fatty persons are often of an entertaining and ease-loving nature, while lean and thin persons are their opposite counterparts. Again, different organic states produce changes in personality. A fatigued and hungry man loses his temper for nothing. Persons whose blood-circulation is abnormal and whose oxygen supply runs short, lack encouragement to work. Again, application of drugs like alcohol produces bodily changes, which in their turn, alter personality. The excess or shortage of sugar in blood also affects personality. Factors like fasting and disease may also produce changes in it. Last but not the least, brain-disorders may cause remarkable changes in personality.

2. *Chemical Factor*: The chemistry of the humours or glandular secretion is an important factor of personality. Hippocrates, Galen and other scientists of Greece grouped personality into four classes according to the predominance or subordination of the four great humours of the body. Persons in whom blood, yellow bile, black bile and phlegm predominate are respectively Sanguine, Choleric, Melancholic and Phlegmatic. This chemical theory of personality is now obsolete. But this theory draws attention to the important part that chemical action plays in the structure of personality and paves the ground for the glandular or hormone theory of the same put forward by the modern science of endocrinology. The Ayurvedic theory of the three phatus or elements, viz., air (*Vayu*), bile (*Pitta*) and phlegm (*Kapha*) as determining different types of personality deserves mention here. The neuro-humoral theory of personality combines the physique of the individual with his chemique as factors determining personality. According to this theory, personality is determined by the interaction of the nervous state of the individual with his glandular secretions.

3. *Glandular Personality*: Glandular secretion determines personality. The glands are twofold, viz., duct and ductless ones. The substances secreted by the glands find their way out of the body through some duct or canal. Salivary, sweat, tear, urine and a part of sex are the main duct glands of the body. Saliva secreted by the salivary glands helps the assimilation of food. Sweat, tear and urine glands eliminate poisonous or waste products from the body. The excess or shortage of salivary secretion interferes with the digestion of food. Too much or too less perspiration, secretion of tears, urination or sex-secretion produce remarkable changes in personality. A person suffering from these disorders may, for example, flare up in anger, strike or insult a friend or lose his job by his rude behaviour with the authorities.

As compared to the duct glands, the ductless glands exert a greater influence upon personality. The substances secreted by these glands find no outlet in the body and so get mixed with the blood to spread over its different parts. The influence of the thyroid, the adrenal and the pituitary among the ductless glands upon personality is great. Excessive or small secretion thyroxin produces various distortions of personality. For example, hypothyroidism results in cretinism, while hyperthyroidism produces myxoedema. The adrenal or the suprarenal gland secretes alrenin or epinephrin. It is also a powerful autacoid like thyroxin. The pituitary gland secretes pituitin which exerts a great influence on personality, for which reason it is called the master gland. The pancreas, the thymus and the pineal glands also determine personality by their excessive or inadequate secretion.

4. *Social Factor*: Personality is not a passive entity but a pattern of different functions. An individual is born and nurtured in society. He acts in response to environmental stimuli. The social environment consists of social role of a person. He abides by the rules and prohibitions of his society and finds in it a place of his own. Social rules and prohibitions or taboos regulate the individual's customs, manners and conduct. The child, for example, has to court ridicule, punishment and even expulsion, if he violates the social code. So he deems it prudent to abide by it. Yet in spite of being regulated by it each individual develops in his own way. Personality is no mere social product, but also the product of the individual's nature. Again, nor is the society a creation of individuals. The social rebel, therefore, is taken to task, punished or even expelled by the society.

The social code is acquired by the individual in childhood. Even the child at play has to obey the rules of the game. If he tells a lie he is disbelieved. On reasonings of the above nature the child comes to learn that it is wise to obey rules and not to tell a lie. Again, every individual has to find his place and function in the society. In the drama of life one is a player, one the stage-maker and another the audience. On the play-ground, again, the place and function of each player as of every other person are fixed. In social life someone is the leader or social reformer, some, again, is the follower. In family life also, one is the father, mother or the child. Thus, the same individual has to play different functions in different situations of life. So social life is a life of inter-personal relationship.

The place and role of the child in the family exert a great influence upon his personality. These depend both upon the child's parents and the child himself. The main function of the child in the family is to grow. Many parents are unjust to their children and fail to afford them the scope for normal growth. Some are over-careful supervisors or over-zealous guardians to the detriment of

the child's growth into a self-reliant and responsible person. The place that the 'spoilt', 'pampered' and undesirable children find in the family, leaves an indelible stamp upon their personality.

Adler⁶ has studied the order of birth of the child in relation to his personality growth. The place of the child in his family is distinct, for in spite of the parent's equal treatment to him he finds his companion in other child. For example, of two brothers the elder one is the companion of the younger and the latter of the former. Adler has attached much importance to the birth order of the child. The only child may grow into a hanger-on or a tyrant, for he has no partner in life to circumscribe his freedom. The eldest son assumes the position and plays the role of the only son for some time and may be dethroned by a new arrival. So he develops a jealous, conservative, authoritarian and power-loving personality. The second child is eager to catch or be equal to the first. So he tends to revolt against the accepted social code. The youngest child is forever the youngest. He wants to remain a pet and dependent. Except in a big family, the fate of every child is associated with some or other miserable place.

But Adler's view does not stand for the test of criticism. No birth order or place in the family is an absolute evil for the child. Besides, children of different birth order are found to have similar personality. Birth order may be associated with some advantages and disadvantages. But these are not the final determinants of the child's personality. Home environment and the child's nature itself are also important determiners of it. To regard Adler as having considered order of birth as the only cause of personality development is, however, to misconstrue him. He has not ignored other factors of personality. The child's personality development, as he shows, depends also on how the mother accustoms him to social life. The mother should take proper care so that the child regards himself as one among other members of the family. Lacking such adjustment the child is faced with various problems. For example, the pampered child wants to become the centre of attraction, while the neglected child keeps himself away. Thus does a style of life develop in the child, which remains unchanged.

Freud also has laid emphasis on family and social place as influencing the structure of personality. The child interjects within himself the punishing authorities of the parents and develops the super-ego or the conscience which plays their role. Loyalty to the parents extends over the larger sphere of social life, so that the child learns to obey teachers, leaders and other father-surrogates. These processes, according to Freud, occur in the unconscious. The future personality development of the child depends upon how he absorbs his relation to the parents. The child in whom the hatred

6. Adler, A., *Understanding Human Nature*, New York, Greenburg Publishing, Inc., 1927.

component of the ambivalent attitude to his parents is conscious, he comes anti-social. In criticism of this view it may be replied that notwithstanding the child's vital relation to the parents, the impact of the society upon him cannot also be denied. It is a fact that a child's personality changes in relation to his companions.

5. *Heredity Factor*: What the individual gets at birth from his ancestors is a great factor of personality. Heredity is the force by which some characters of the previous generation are transmitted to their descendants. The hereditary factors of personality are those that reside in the child from the moment of conception. On the other hand, the factors that work upon the child from the moment just after birth are those of the environment. That heredity greatly determines personality is certain. Like that of other higher animals, man's life also starts as a protoplasmic cell or as a zygote formed out of the union of two parental cells. His future is contained potentially in the zygote. The heredity of an individual is unchangeable. But the environment bears closely upon heredity in the development of the individual. Environment determines which heredity factor will develop to which extent. In the development of the individual heredity plays a definite, while environment an indefinite, role. Environment cannot originate an ability which was not transmitted by heredity. Its improvement only facilitates the development of the best among the hereditary factors. Again, environmental progress is confined to the individual, while heredity determines the progress of a species of individuals. Of two persons equally intelligent, one enjoying better environmental facilities makes more progress in education than the other with no such advantages. But the next generation of both these individuals starts where these two predecessors started, with no benefit accruing to the descendants of the more fortunate of them.

So heredity lies at the root of all the possibilities of personality development, environment being a means to the actualisation of these possibilities. An individual or a nation cannot be made highly intelligent by sheer training or practice, unless the factors of heredity are favourable. Social heritage also, like individual heritage, contributes to the development of personality. The child is born with a social heritage. The parents cannot transmit their acquired characters to other children at birth. Yet the accumulated wisdom and ethos of collective humanity pass over to the child. This acts as an environment stimulus to the development of the child's personality. Parental heredity is congenital. But the accumulated culture of the ancestors has got to be acquired by the individual anew.

Types of Personality

There are various types of personality. Different psychologists

have given different types.⁷ A detailed description of types is given below:

1. *Greek type personality*

Ancient Greek scientists like Hippocrates and Galen grouped personality into four temperamental types. According to them personality is: (1) Sanguine (2) Choleric (3) Melancholic (4) Phlegmatic.

Sanguine persons are always restless and spirited. Choleric individuals become short-tempered and active. Those who are melancholic are of morose temperament and phlegmatic persons are dull and calculating.

2. *Glandular type personality*

Berman has given a number of glandular personality types. They are as follows:

- (a) Adrenal personality is determined by excesses or shortage of adrenal secretion. Hyper-adrenal personalities are of those who have excessive secretion of adrenal glands and are therefore vigorous, energetic and persistent. They have hair all over the body. Their skin is thick, hair dry and teeth large. They show qualities of physical and psychic vitality. Hypo-adrenal personalities are of those who suffer from inadequate adrenal secretion. They are nervous people. Their blood pressure always goes down. They are full of indecision. They are also irritable and unbalanced.
- (b) Pituitary type personalities are determined by an excess or shortage of pituitary secretion. Hyper pituitary personalities are those who have brain power, physical development and muscular vigour. They are dull and have sexual potency. Hypo-pituitary personalities are those who are dull, dwarfish, sluggish and unbalanced. Napoleon, Darwin, Nietzsche and Julius Caesar had all pituitary personalities according to Berman.
- (c) Thyroid personalities are those who have excessive or inadequate secretion of Thyroid glands. Hyper-thyroids are of those who have vitality and sexuality. Sometimes they lack emotional balance. Hypo-thyroidism leads to inadequate sexual impulse. Women who have hypo-thyroidism dress like men and men, likewise, dress like women.

3. *Freud's type of personality*

The following is the classification of personality according to Freud.⁸ Freud classification of the psycho-sexual stages of development correspond to the changes in personality, for example, the child at first derives pleasure from the stimulation of its oral orifice through sucking at the Oral-erotic stage. It is in the beginning passive or masochistic, for at this stage the child wants to retain the mother's nipple in his mouth. Now the child's life is like that of the parasite, when he remains inert, dependent and optimistic. At the next stage the child's passive anal-erotism becomes active or sadistic. Now the child is aggressive in not merely retaining the mother's nipple in its mouth but also in biting it and entertaining an attitude of jealousy, ridicule and despair in relation to the mother. The second stage of the child's psycho-sexual development is Anal-erotic. In it the centre from which the child derives pleasure shifts from the mouth to the anus. Here the child is at first active and later on passive. In the first stage the child derives pleasure from the contraction and the expansion of the anus and in the other it has it from the anus and faces themselves. Mentally the child at this stage grows awkward, obstinate, egotist and opportunist. At the third stage of its psycho-sexual development, the child becomes genital-erotic, which at first is Phallic and then Genital. The first is relatively vague and homogeneous in which the child thinks all individuals as possessed of the penis and derives sexual pleasure from the mouth, the anus and all parts of the body. So the child at this stage is called 'polymorphous perverse.' The Genital phase is the normal stage of psychosexual development, in which the genital organ becomes the centre of sexual pleasure. At this stage the child is creative, adaptive, dependable and cooperative.

4. *Spranger's philosophical types*

Spranger's philosophical types of personality consist of the Theoretical, the Economic, the Aesthetic, the Social and Political and the Religious. The first is dedicated to philosophy and science. The second is materialistic, the third a lover of beauty, the fourth a philanthropist, the fifth a lover of power and the last an aspirant for the greatest good of life through the help of absolute force.

5. *Sheldon personality types*

W.H. Sheldon and S.S. Stevens have shown differences in temperament and mental structure corresponding to different bodily structures. They call predominance of bodily softness and roundness Endomorphy. An endomorphic personality has fatty and lax abdomen, undeveloped bones and the endomorphic person is Viscerotonic. A viscerotonic personality pines for ease, rest, love,

8. Freud, op. cit.

support, entertainment and help in danger. Secondly, Sheldon calls a bony and muscular body Mesomorphic, which is neither fat nor thin but slim. From the side of temperament and mental structure, a mesomorphic person is Somatotonic, who is active, reckless, aggressive, competitive and self-assertive. Thirdly, the predominance of skin and nerves makes a body Ectomorphic, which is weak and frail. From the side of temperament and mental structure, ectomorphic individuals are Cerebrotonic, whose attitude and way of life are restrained and stiff. They suppress emotions, are afraid of people, lack self-confidence and seek solitude when in sorrow.

6. *Eric Fromm personality types*

Eric Fromm has grouped personality into five types, viz., Receptive, Exploitative, Hoarding, Marketing and Productive. These correspond respectively to Freud's Passive Oral-erotic, Sadistic Oral-erotic, Passive Anal-erotic, Sadistic Anal-erotic and Phallic types.

7. *Kretschmer's personality types*

Kretschmer's personality types are based on the structure of the body and that of mind. Personalities from the standpoint of bodily structure are fourfold, viz., Athletic, Asthenic, Pyknic, and Dysplastic. Athletic personality has a strong-built body with firm muscles, wide chest and shoulders, large hands and feet. Asthenic personality is usually lean and tall with flat chest. The Pyknic personality has large head, chest and abdomen with large cavities. His body is plump, roundish and rich in fat. His face is soft and broad. He has small yet broad hands and legs. The secondary sexual characters of a Dysplastic personality are undeveloped. His body is also undeveloped and unbalanced. From the side of mental structure, again, Kretschmer points out two types of abnormal personality, viz., Cyclothymic or Manicdepressive and Schizophrenic. The first manifests itself in extreme emotions changing repeatedly, and rapidly. Sudden excitement and joy alternated with depression and melancholy are its characteristics. But in spite of such emotional disturbances, the cyclothymic personality maintains normal contact with the world. The Schizophrenic personality lacks unity and splits up into many personalities. He is shut up within himself and loses contact with the world. Besides these two abnormal personalities, Kretschmer divides normal personality into two types, viz., Cycloid and Schizoid which are the normal counterparts of the Cyclothymic and Schizophrenic personalities. Jung's introvert and extrovert types correspond to the Schizoid and the Cycloid respectively. The schizoid is self-centred, given to imagination, unsocial, hot-tempered, unsympathetic, eccentric and often intelligent. The cycloid, on the other hand, is social, good-natured, active, sentimental, excitable and restless. The cycloid and the schizoid when abnormal become cyclothymic and schizophrenic.

8. *Jaensch's personality types*

According to Jaensch personality is divided into 'T' type and 'B' type. There may be also mixed types like BT, TE, BH. These are based according to differences of susceptibility to the eidetic image.

Traits of Personality

Trait is usually an adjective like industrious, sad, cheerful liberal and ease-loving. A trait of personality means such a distinctive character of a person's thoughts, feelings and actions as marks him off from other persons.

Cattell⁹ has done a good work on personality traits. He has distinguished between the surface traits of personality and source traits of personality. According to him, surface traits and source traits are 20 and 20. They are as follows:

The Main Surface Traits

1. Fineness of character	Versus	Moral defect, Non-persistence.
(a) Integrity, altruism	„	Dishonesty undependability.
(b) Conscientious effort	„	Quitting, incoherence.
2. Realism, emotional integration	„	Neuroticism, evasion, infantilism.
(a) Realism, reliability	„	Neuroticism, changeability.
(b) Practicalness, determination	„	Day-dreaming, evasiveness.
(c) Neuroticism, self-deception, emotional intemperateness	„	Opposites of these.
(d) Infantile, demanding, self centredness	„	Emotional maturity, frustration, tolerance.
2. Balance, frankness, optimism	„	Melancholy, agitation.
(a) Plasticity, social interest	„	Agitation, melancholy, obstinacy.
(b) Balance, frankness, sportsmanship	„	Pessimism, secretiveness, immoderateness.
3. Intelligence, disciplined mind, independence	„	Foolishness, undependableness, unreflectiveness.

9. Cattell, R.B., *Personality*, McGraw-Hill, 1951.

(a) Emotional maturity, clarity of mind	Versus	Infantilism, dependence.
(b) Gentlemanliness, disciplined, thoughtfulness	„	Extroversion, foolishness, lack of will
(c) Creativity, self-determination, intelligence	„	Narrowness of interest, foginess.
(d) Intelligence, penetration, general talent	„	Lack of general ability.
4. Egotism, assertion, stubbornness	„	Modesty, self-effacement, adaptability.
5. Boldness, independence, toughness	„	Timidity, inhibition, sensitivity.
6. Sociability	„	Timidity, hostility, gloominess.
7. General emotionality, high-strungness, instability	„	Placidity, deliberateness, reserve.

Primary Source Traits

1. Easygoing, genial, warm, generous	„	Inflexible, cold, timid, hostile, shy.
2. Intelligent, independent, reliable	„	Foolish, unreflective, frivolous.
3. Emotionally stable, realistic, steadfast	„	Neurotic, evasive, emotionally changeable.
4. Dominant, ascendant, self-assertive	„	Submissive, self-effacing.
5. Placid, cheerful, sociable, talkative	„	Sorrowful, depressed, seclusive, agitated.
6. Sensitive, tender-hearted, sympathetic	„	Hard-boiled, poised, frank, unemotional.
7. Trained and cultured mind, aesthetic	„	Boorish, uncultured.
8. Conscientious, responsible, painstaking	„	Emotionally dependent, impulsive, irresponsible
9. Adventurous, care-free, kind	„	Inhibited, reserved, cautious, withdrawn.
10. Vigorous, energetic, persistent, quick	„	Languid, slack, day-dreaming.
11. Emotionally hypersensitive, highstrung, excitable	„	Phlematic, tolerant.
12. Friendly, truthful	„	Suspicious, hostile.

Measurement of Personality

There are many instruments that have been developed to measure personality. Personality measurement may be divided into two sections. (1) Non-Projective Tests; and (2) Projective Tests. Besides this, the methods of measurement of personality can be classified as objective or subjective. The following is the description of the methods of personality measurements. (see Fig. 1)

1. *Graduated Scale or Rating Scale*

The measurement of personality with a graduated scale is also called the Rating Scale. The personality of a number of individuals can be measured in terms of the ease-loving, industrious, etc.

The above rating scale is marked into seven points, though there might be more points in it according to variation in the degree of a trait or quality. Of Rajesh, Krishan, Chuni, etc., it is found that two of them are placed at the mid-point of the ease-loving and industrious, while one each of the rest finds his place at the other points. (see Fig. 2 on page 332.)

2. *Interviews*

With the help of an interview technique we get an information about an individual, but personal interview cannot be called an objective type of test. However, interviews lay scope for appreciating the individual's feelings and attitudes. In it is revealed how the subject speaks on a particular topic, where his voice changes and in what ways and where he gets struck.

3. *Observation*

Observation is of great value in throwing some light on the personality of the boys, in gauging their different natures and in forming some idea about their work-interests and work experiences; for example, the boy can be asked to recite a poem, to narrate a story or know incidence from their lives of their childhood days. The purpose of observation is to watch social behaviour, individual characteristics, likes and dislikes and leadership qualities.

4. *Paper and Pencil Test*

To test a number of persons simultaneously, a Questionnaire consisting of a series of questions with 'yes' or 'no' written against them is supplied to the testees. The testee has to strike off one and retain the other of these answers. For example:

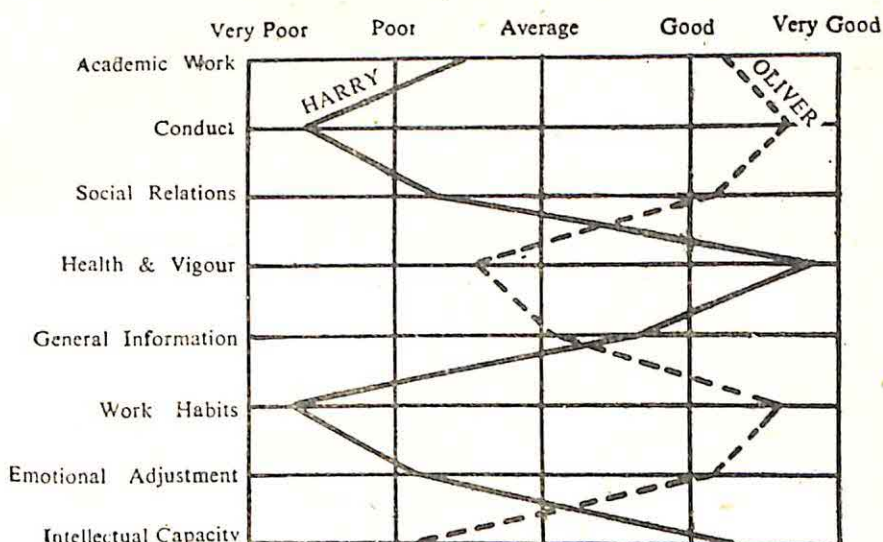


FIGURE 2

Profiles Picturing the Abilities and Traits of Two Boys, as Indicated by Rating Made by Their Homeroom Teacher

'Yes' or 'no' answers to the questionnaire throw light upon the personality type of an individual. The Questionnaire Method varies according to variation in the method of selecting questions. For example, the Minnesota Multipurpose Inventory is meant for measuring different personality traits both in the normal and abnormal persons. Again, the Allport-Vernon Scale measures economic, political, social, religious and aesthetic values. Moreover, the Cattell-Luborsky Test tries to measure personality by examining individual tests and sentiments. The Questionnaire Method is, however, objectionable on the ground that it demands answers either in the affirmative or in the negative, while the vast majority of individuals would prefer an intermediate answer.

5. *Situational Tests*

The measurement of personality by observing how a person behaves in and faces different situations of life seems to be more satisfactory than by the Questionnaire Method. For example, to test the honesty of children, they may be placed in situations which enable them to deceive the psychologist. In one test children may be given coins to be put into a box, so that the psychologist may see which of the coins have been left and which stolen. But such tests prove the child's honesty only in one situation.

6. *Experimental Tests*

Experiments may be made to measure personality. For example,

it is experimentally determined how the perceptual process of college students is influenced by their interests. At first their scores are ascertained and a few words associated with their interests are selected. For example, economic interest is measured by showing them words like value, dollar, etc., religious interests by words like prayer, God, etc., and asking them what these words are. They are found to recognise these words in shorter or longer time according to their interests. Such experiments prove that interest in objects makes their recognition prompt.

Projective Methods

Projective methods aim at observing a person without giving him to understand that he is put to test. In projective method the individual may project his personality into what he does. The following are two important projective tests.

(a) *Rorschach Test*: This test is also called ink-blot test. The Rorschach ink-blot test is now quite generally accepted as a valid instrument in determining the dynamics of personality. The test is also culture-free test because this test can be applied successfully on subjects from different cultures. Rorschach test consists of ten cards of blots.

Of the ten ink-blots, five are black and grey, two black and red and the rest fully coloured. The testee is shown one blot after another and is asked what it might be or might suggest. It is tested whether (i) the whole or a part of the picture produces the reaction of the subject; (ii) the dark shade, colour, size or motion of the picture determines his reaction; and (iii) the subject discovers any man, beast, the limbs or some other object in the picture. Reaction upon the whole block indicates subtlety of thought or theoretical knowledge, while the same upon a part suggests compulsion neurosis. Secondly, perception of movement suggests introversion, while that of animal shapes indicates narrow thinking. Thirdly, excessive reaction upon colour expresses the subject's impulsiveness. Again, reaction upon colour and shape as well indicates his spontaneity of emotional expression.

(b) *Thematic Appreciation Test*: Thematic Appreciation Test or TAT as devised by Murray and Morgan means the interpretation of a number of pictures. These pictures represent vague stories. So the subject gives vent to his mental attitude in explaining them variously. The subject is asked to narrate a story centred round the incident portrayed in the picture. He has also to say how the incident may have taken place and what might follow as a result thereof. The fun is that the subject happens to identify himself with one or other character depicted in the picture and his narration becomes a sort of autobiography. Thus are expressed many feelings, emotions and motivations of the subject, which he would

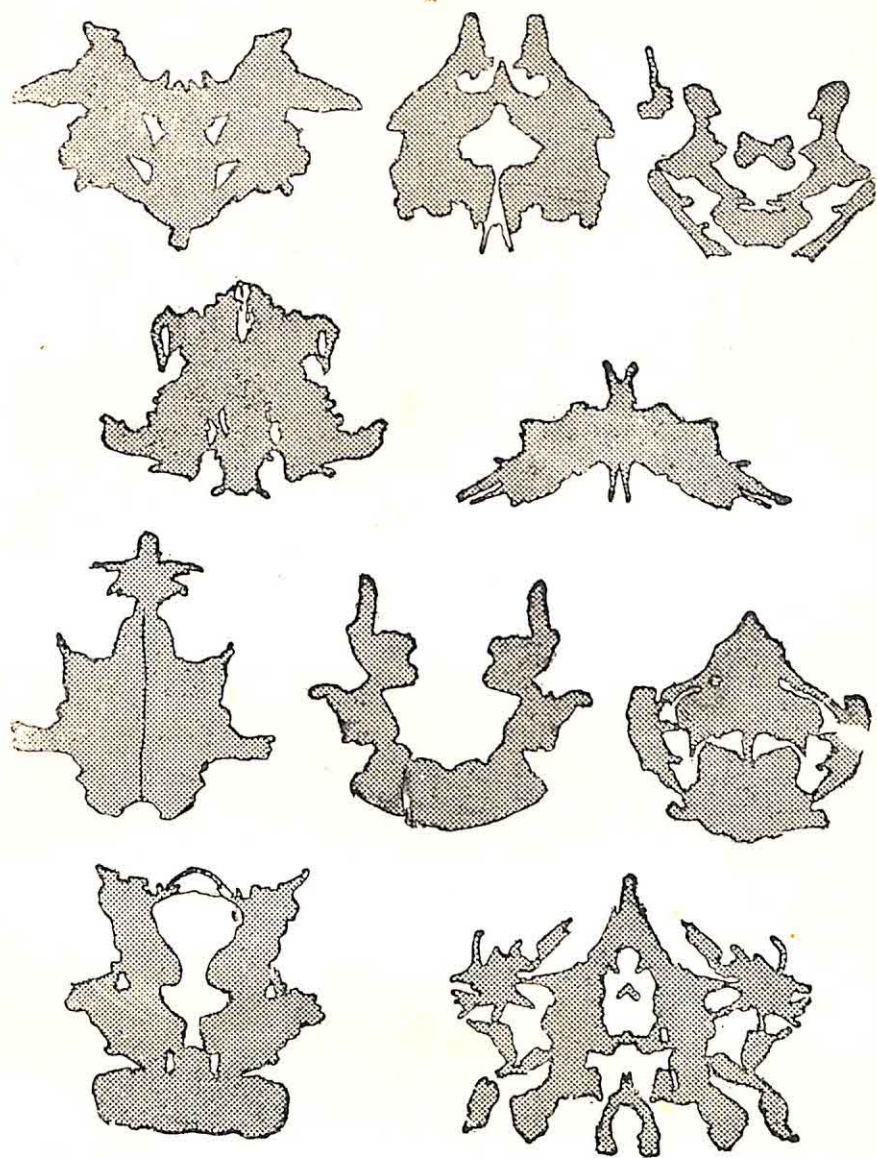


FIGURE 3
Rorschach Test (Ink-blot Test)

be reluctant to express voluntarily. In it, a well-built youth is seen by the side of an old woman. Personality of the interpreter is indicated by how he explains the attitude of the youth to the old woman and that of the latter to the former.

8. Word Association Test

In this test, the subject is showed or told a number of personality-indicating words and is asked to say or write out the word suggested to him by them. Some responses come out promptly and others with delay. The latter indicates the subject's complexes or repressed wishes. On the basis of this test C.G. Jung has divided personality into introvert, extrovert and ambivert, among other types.

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NEEDS, NATURE AND EDUCATION OF EXCEPTIONAL CHILDREN

ARTICLE 45 of the Indian Constitution directs that free and compulsory education should be provided to all children, including those who are physically, mentally and socially handicapped. Till now, no steps have been taken to extend the provisions of compulsory education to physically, mentally and socially handicapped children. Therefore, it is our moral responsibility to see that a positive educational programme is devised under which facilities would be available for the education of these specific groups including those who are gifted.

Teaching the Blind

The individual receives impressions of the world only through the senses. It is evident, therefore, that any deviation from normal vision has important significance. More impressions reach the brain for interpretation through the sense of sight than through all the other senses combined.¹ Visual difficulties may influence the life of the individual in the physical, mental, social, educational and vocational aspects.

The first concern of all professional individuals and authorities is to prevent blindness and other visual impairment by finding the causes, diseases, malformations, accidents, etc., and by discovering and putting into effect ways and means of eliminating them. The second responsibility is to make adequate provisions for those already affected. Blind children may be classified² according to one of the following groups, but since a sharp line of demarcation cannot be drawn, the needs of each child must be considered individually.

Group A: Children having deviations from generally accepted

1. Hathaway, W. and Lowenfeld, B., "Teaching the Visually Handicapped" in *Education of Exceptional Children*, Forty-ninth Year Book, Part II, 135.
2. *ibid.*

visual norms that are amenable to medical treatment or that can be so compensated for by optical aids that they may be included, educationally and vocationally, in the group of normal seeing.

Group B: Children who have such serious visual impairment that even with medical treatment and optical aids they cannot use advantageously the educational media provided for the normally seeing, yet have too much sight to make appropriate use of the media provided for the blind.

Group C: Children who, after receiving all needed medical attention and optical assistance, are educationally and vocationally blind.

Since with adequate attention, children in the first category can be included with the normally seeing, the educational programme is concerned of the partially seeing and of the blind. As far as partially seeing children are considered they are those who, although seriously handicapped by visual impairment, have sufficient sight to make this sense the chief avenue of educational approach. In this group we may include: (a) children having a visual acuity between 20/70 and 20/200 in the better eye after all possible medical care and optical aid have been provided; (b) children with serious progressive eye difficulties; (c) children suffering from diseases of the body that seriously affect vision; (d) children with normal mentality who, in the opinion of an ophthalmologist and the educational authorities, need and will benefit by the special equipment and opportunities provided for the partially seeing even though they do not fall within the above classification.

The best method of discovering partially-seeing children is by having all children given thorough medical examinations, including an ophthalmological examination, before they enter school and at specified intervals throughout their school life. Where such procedure is not possible, visual screening may be undertaken by the District Health Officer of the State in order to discover children who should be referred to for ophthalmological examination. Such screening can also be done by the school headmaster. It is further the responsibility of the headmaster to follow through on all referred cases in order that every necessary attention may be given. It is also the obligation of the parents to have their children examined, but, should they be unable or unwilling to do this job because of various unfavourable circumstances, it is the function of the school headmaster to see that necessary attention is provided.

Moreover, the best method of providing educational facilities for the partially seeing is through the establishment of special classes. In general, the number of partially-seeing children requiring special educational facilities is in promotion of one to five hundred of the school population.³ It should therefore, be easy for the

District Education Officer to judge, at least approximately, the number of such pupils in their districts and to decide whether the establishment of special classes for them is necessary or if other provisions must be made. Since one class may serve more school children of the neighbouring schools, the special class should include children of various grades. That school may be selected which is centrally located because that will facilitate transportation. For children living in rural areas, several possibilities may be offered. The first possibility is that of boarding (provided it is subsidised by the State). Second possibility is that of providing assistance by way of providing a special teacher who may give the needed assistance to the teacher in the rural areas who has a partially-seeing child in his class. Thirdly, special facilities may be provided to the primary school-going children, because the sooner the partially-seeing child is given the needed advantage the greater is the hope of success. Besides the points mentioned above, for children whose eyesight is too weak, books printed in large clear pencils with thick soft leads and unglazed paper should be provided. Sufficient light should be provided on his working place. Seating arrangement should be made in such a way that a partially-blind child can see satisfactorily. Chalk boards, bulletin boards, charts, graphs, demonstrations and other allied information are to be provided.

For blind children, 'going to school' means admission to a residential school for the blind or (Braille classes). Fundamentally, the blind school is meant for assisting the blind child, through the use of special methods and aids, in his adjustment to the world in which he has to live as an adult. Braille class supplies only such supplementary assistance as is necessary to enable the blind pupil to participate in regular class-room instruction, a programme under which the child does not change his home environment. Both types can be successful in accomplishing objectives, as is exemplified by many well-adjusted blind individuals in all walks of life. Social adjustment of the individual is the most important aim of education. Schools for the blind should usually provide for their individuals social activities such as dancing, scouting, literary and dramatic art clubs. Blind children should have as many contacts as possible with seeing boys and girls and with people in general. During holidays and vacations, which the children spend with their families, they should be given every opportunity to participate with the social life of the age groups and of the community. Braille classes should be started in as many districts as possible so that blind children in large numbers in the district may attend such schools. Special provision is also desirable for handicrafts, physical education, and music instruction.

According to Hathaway and Lowenfeld⁴ visual handicap has a

4. *ibid.*, pp, 144-145.

modifying influence on the development of the child and on the methods used in his education, but it must be kept in mind that the blind child is, in most respects, a normal child. His growing intellect, his developing functions, his emotions, and his desires are fundamentally like those of all children. Therefore, everything that can be learned from child psychology and education in general will prove helpful in understanding the blind child's psychological and educational needs. It should also be stressed that the degree of visual handicaps varies from individual to individual. The child even with a small amount of sight will consider it one of his greatest assets. If the teacher does not recognise this and treats the child as blind, he may drive him into opposition and resentment.

Blind children require for their education special equipment and medium as well as the application of special principles of teaching. Since blind children rely almost exclusively upon their senses of touch and hearing, particular attention should be given to practice on the regular typewriter because it permits written communication with the seeing.⁵ In the teaching of mathematics, mental number work is stressed.⁶ In geometry embossed diagrams are used.⁷ In the study of geography, relief maps and globes are to be used and excursions are to be taken to acquaint children with their surroundings.⁸ Visits to museums and the use of specially prepared educational models are to be provided for additional experience.⁹ In general, it may be said that practically all subjects can be taught to blind children. This is particularly true in the study of sciences where demonstrations must appeal to the senses of touch, hearing, or smell in order to be meaningful to blind students.¹⁰ Regarding creative activity it may be said that drawing and painting are not possible for blind children. But modellings can very well be substituted for these arts. Many blind children show considerable talent in it and derive much pleasure from working with clay and plasticine. Dramatic art in all its forms from the dramatising of a fairy tale to the staging of a full-length play, is to be cultivated. Dramatic art also, indirectly furthers social adjustment by improving poise and increasing self-confidence.¹¹ The art with which the blind are associated is music and, therefore, this art should be given adequate encouragement. Blindness restrains the individual's physical activity. Therefore, gymnastics, corrective posture work, such as sports, running, swimming, rowing, wrestling and all kinds of outdoor activities form an important part of the physical education programme of the blind.¹² Handicrafts of various kinds may also

5. *ibid.*, pp. 146-147.

6. *ibid.*

7. *ibid.*

8. *ibid.*

9. *ibid.*

10. *ibid.*

11. *ibid.*

12. *ibid.*

be taught to the blind. Home making and household arts are to be stressed for the blind girls.

Regarding special principles of teaching, it may be said that the teacher for the blind must apply certain educational principles. The research evidence¹³ collected is reproduced below:

(a) *Concreteness*. Only through factual perception can the blind child gain a real knowledge of the world around him. Hearing has the greatest value as a social contact medium and as a source of descriptive information, but an actual knowledge of the objects and their spatial characteristics can only be gained from touch observation. Instruction of blind children must give them as many concrete experiences as possible, either by letting them observe the object as such or by providing replicas on which they can observe the characteristic features. The teacher of the blind children must understand that his pupils need to become acquainted with objects and materials in their environment and this acquaintance should not be verbal but mostly the result of direct observation. Concreteness may help the blind child to avoid falling into a pattern of unreality and verbalism which may interfere with his later adjustment to the requirements of living.

(b) *Unified Instruction*. Blindness puts the child at a serious disadvantage in experiencing things and situations in their totality. The blind child gains many impressions. He may hear and smell something, he may feel air currents or temperature changes; he may have touch contact with some part of an object or situation. But all these impressions are discrete and scattered and remain so unless experience or teaching organises them or unifies them. Blind children, at least during the primary classes, should be taught by a unit plan of instruction and not by unrelated interests in formal subjects. Such a unit treatment must supply them with informational experiences which they cannot gain by chance observation and should help them to organise their experience into a structured whole by insight. Topics to be presented as units of the study for blind children should be taken from everyday experiences such as the grocery and other stores, the shoe repair shop and workshops, the post office and other public institutions, the municipality and other organisations.

(c) *Additional stimulation*. The limitation in the ability to get about is considered the most serious effect of the handicap. As a result of it the blind child cannot expose himself to a great variety of experience which is a normal part of a seeing child's life. For this reason the teacher of the blind child is confronted with an entirely different task than the teacher of seeing children; it is almost entirely up to him to provide opportunities for the experiences of his blind pupil needs.

There are chiefly two ways in which this additional stimulation can be supplied. The pupils can either be taken to the experiences, such as, study excursions, field trips, museum visits or the experiences must be brought to them such as radio programmes. The effectiveness of these activities depends largely upon the preparatory and follow-up work connected with them. Efforts to supply blind children with educationally desirable experiences must also extend to improving the individual's own ability to get about and secure stimulation for himself. Blind children should learn to move about with ease on familiar grounds and should acquire facility in the most efficient use of the cane. They should also know about all other possible aids in getting about, such as guide dogs, human aids and all means of transportation. Exercises in mental orientation starting with a mapping out of the classroom and extending gradually to orientation in the streets and places of the community are an essential part of the travel instruction.

(d) *Self-activity.* The blind child is from his earliest days hampered in his activity. Lack of sight limits him in receiving activating stimulation from the outside world and makes imitation based on visual observation impossible; the blind infant, for instance, does not reach out and crawl towards objects, because they do not attract him, the blind child's learning is slower and more difficult because demonstration which can be factually observed, must be employed; conforming with the group is a greater problem because it cannot be learned by watching others. Thus, although the basic patterns of the developments are the same for the blind and seeing children, it is to be expected that the rate of development there are in areas such as apprehension, walking, talking and socialisation may be slower. The blind child must receive training and guidance which will encourage the development of his maturing functions. Self activity is an essential part of his training because only by coping with his environment will he gain self-confidence which will enable him to live as a blind person in the world of seeing. It will also counteract a frequently found tendency to day-dreaming, inactivity or poking the eyes. The blind child must be encouraged to do as many things for himself as are desirable and compatible with a well-conceived time economy.

All the above remedial measures can be achieved if all those concerned—educators, authorities and parents cooperate together in the education of partially blind and totally blind children. This will help the blind children in their feelings that they are recognised as individuals in their own right.

Teaching the Deaf

The number of deaf schools in India is negligible. Loss of hearing may be present at birth or may be acquired at any period during a person's life span. The degree of loss may vary from

slight to profound and the effect of the loss may manifest itself in varying degrees in personal, emotional and social adjustment, in educational achievement and vocational efficiency. The earlier in life the loss of hearing is identified the sooner the individual can be given the special medical and educational assistance which may help him to assume his place satisfactorily in the society of which he is an integral part. On the basis of the research evidence the following groups are classified:

A. Children with slight losses. These children are on the border line between normal hearing and significant defective hearing.

B. Children with marked losses. These are hard of hearing children.

C. Children with less marked losses. These children are on the border line between the hard of hearing and the deaf. They do not have enough hearing to learn language and speech with unaided ear, but have residual bearing which can be utilised in their education.

D. Children with profound losses. These are the deaf children who do not learn speech and language through their ears even with benefit of amplified sound.

Children who fall under category A usually need no special consideration other than favourable seating in the classroom. Children under category B should be provided with hearing aids and should receive auditory training. Special class instruction may be provided for the more severely hard of hearing in this group, if the adjustments are unsatisfactory in the regular classroom. Children who fall under category C are the children who suffer from marked losses. Their losses range between 54 and 75 decibels in the speech range in the better ear and who have sustained loss from very early childhood. These children may be considered educationally deaf since they require instruction especially designed to foster the acquisition of language and speech even when they make optimum use of hearing with the help of hearing aid. Given adequate educational opportunities, they may acquire language and speech rapidly. Initially these children should receive training in the deaf schools from teachers trained to develop language and speech. Children who suffer from profound losses, i.e., category D suffer from the inability to distinguish highest measurable level of intensity. For such types of children educational facilities should be provided in schools for the deaf.

Scientific data pertaining to some phases of the problem of deafness in India are amazingly lacking. Statistically speaking, we know comparatively very little about the extent of deafness in India. Therefore, the first step should be to have complete data gathered about the deaf in India. In each Tehsil at least one teacher should

be engaged for the service of children who have marked hearing losses. They should have received training in the deaf schools established elsewhere. The states of India should nominate at least 10 persons each year for receiving training in deaf schools whose total number in India is 44. This special training will provide a thorough understanding on the principles of hearing rehabilitation; testing of hearing educational diagnosis; lip reading and auditory training; speech development and correctional; language development, reasoning technique and extensive practical training with deaf children. This special training can be secured in a number of training centres in schools for the deaf in the adjoining states.

Besides the points raised above, there is need of a great deal of investigation and of the standardisation of psychological and achievement tests which can give us deeper insight into the problems of the deaf and hard of hearing.

Teaching Children with Speech Handicaps

Speech defectives comprise the largest single group of handicapped school children. Speech is the most used of all the language functions and the most fateful, day in and day out, in the social relationships of people everywhere. What is done about speech, and especially speech disorders, in our schools is, therefore, of the utmost importance to the pupils as individuals and to the society which they will help to develop as they become adult citizens.

Stuttering affects six to ten out of every thousand school children.¹⁴ Stammering children comprise probably the largest single group of handicaps in our schools. But one thing is certain that for the most part they are normally educable and potentially employable aside from their speech defects. In view of the substantial progress made in speech correction in recent years, the great majority of handicapped children can be corrected or materially benefited. Again, much of the special attention and help handicapped children need can be given by the classroom teacher through judicious adjustment of teaching policies and methods, together with special instruction and personal attention that is not exclusively time consuming and can be given by any teacher who has had an elementary education in speech correction.¹⁵

Teaching the Orthopaedically Handicapped

Orthopaedically handicapped children include all children with defects in size and structure of bones and joints with deviation in muscle strength, coordination or control.

Whenever their physical abilities permit, orthopaedically handicapped children should attend regular classes with normal children,

14. Johnson W., *Teaching Children with Speech Handicaps*, op. cit., p. 117.

15. Some work Books are:—(contd. on p. 398 bottom)

where they would get almost the same kind of experiences as possible and may learn to respond on the level that will be expected of them when they enter the competitive world. For those who are not physically capable of such a programme, it is desirable, as well as necessary to provide facilities, curriculum and equipment so that all may receive educational benefits. Residential facilities should be given to those who suffer from acute handicaps. To those special teachers who know the technique of handling such type of children facilities should be given. Moreover, transport facilities should be provided for whom transportation facilities are not available, or who are excluded from school for some other reason. For all types of orthopaedically handicapped children use should be made of visual aids, motion pictures, slides, stereopticons and projected books which may help the child to read. Interest in music should arrange group projects in art, venturing into story telling, and singing. Finger painting should also be explored. Extracurricular activities which are closely linked with various places of classwork and at the same time provide excellent means of outside social contacts including outings, school picnics, trips to zoos, museums, factories, farms, etc., should be arranged. Games and activities requiring exercise within the physical capabilities of the children, can be arranged in accordance with individual needs and limitations.

Vocational guidance, education and training are integral functions of training programme which the authorities should take note of. Also psychological service should form an effective part of the educational programme for the orthopaedically handicapped children.

The most important function of the teacher is to help the child to accept his handicap, to prevent the psychological crippling which is more damaging than the physical handicap.¹⁶ He should possess personal friendliness, warmth, interests, patience, kindness and honest liking and respect for children. Every effect should be directed towards assisting the child towards the greatest possible

- (a) Ainsworth, Stanley. *Speech Correction Methods*. New York, Prentice-Hall, Inc., 1948; Bryngelson, B., and Glaspey, E., *Speech Improvement Cards*. Chicago, Scott, Foresman & Co., 1941; Fairbanks, Grant, *Voice and Articulation Drillbook*, New York, Harper & Brothers, 1940; Johnson, *Speech Problems of Children*. Prepared by the American Speech and Hearing Association for the National Society of Crippled Children and Adults. New York, Grune and Stratton, 1949; McCullough, Grace, *Work and Practice Book of Speech Improvement*. Magnolia, Massachusetts, Expression Co., 1940; Schoolfield, Lucile D., *Better Speech and Better Reading*. Magnolia, Massachusetts, Expression Co., 1937; Van Riper, Charles, *Speech Correction: Principles and Methods*, New York Prentice Hall, Inc., 1947; West, Robert, Kennedy, Lou, and Carr Anna, *The Rehabilitation of Speech*, New York, Harper & Bros., 1947 (revised)

16. Linek, L. I., Shover, J and Jacob, E. E., *Teaching the Orthopaedically Handicapped and Cardiopathic*, Forty-Ninth Year Book, Part II, pp. 194-215.

degree of self acceptance, self reliance and adjustment to his limitations.¹⁷ Teacher must also understand the family background of the handicapped child.

The states of India should provide special equipment for the crippled. The need of the hour is that the state should have at least one or two institutions situated in urban areas. Moreover, the public should see that there is greater or better integration of the handicapped to the community life, the schools offering an important means of reaching this goal. This involves not only research into educational techniques and modernisation of curriculums but also greater use of the school as a social centre. In this way, we hope to make measurable progress towards our ultimate good for the crippled child to make him a happy person and good citizen, offering his fullest possible contribution to his family, state and country.

(B) Mentally Handicapped Children

The problem of a child with retarded mental development assumes considerable importance in the general programme of education. Authorities as well as teachers have to become increasingly concerned about those pupils who find it difficult to profit from the ordinary programme provided for normal children. In the absence of special provisions for the mentally handicapped, the problem becomes acute because the curriculum is not adapted to the needs and abilities of these pupils. No survey on a large scale has been conducted in this country, much less in this State, to find the incidence of mental deficiency. The surveys conducted so far¹⁸ indicate that six lakhs of children population in the country may be mentally deficient. Gokhale¹⁹ gives the estimate of mentally handicapped children in India as 15 to 18 lakhs. This is the most serious problem which requires serious thought and serious action by all sections of society.

Some of specific characteristics²⁰ which may be noted in determining mentally handicapped children are: social incompetence resulting from developmental mental arrest of constitutional (heredity or acquired) origin; the condition is essentially sometime incurable through treatment and unremedial through training though in favourable circumstances mentally handicapped may improve.

17. *ibid.*

18. Prepared by Research Unit, *Directory for Institutions for the Mentally Retarded in India*, Children Club, Government Institute of Special Education, Chandigarh, p. 1.

19. *ibid.*

20. Kelly and Stevens, *Special Education for Mentally Handicapped*, op. cit., 238-39.

Discovering the Mentally Handicapped

Teachers may well serve as the key people in evaluating the reactions of their pupils, educationally and socially. Many teachers must first be oriented in the initial steps of critically gauging individual progress with reference to the progress of a group as a whole, individual adjustment as compared with the maturational level expected of pupils of a given age, and individual physical efficiency which should be manifest for definite pupil-age groupings.

Some of the specific characteristics which may be noted in determining pupil maladjustment are as follows:

1. Educational

- (a) He is not able to think abstractly or to handle symbolic material.
- (b) He is significantly below the level of most children of his age in school efficiency.

2. School

- (a) He may react to his educational inefficiency by social misbehaviour.
- (b) He indicates a definite immaturity by his non-acceptance of personal and social responsibilities.

3. Behavioural

His slow learning may be manifested by poor coordination and lack of flexibility or adaptability. Sensory defects in the visual, auditory, or motor areas may be concomitants of his slow-learning ability.

Educating the Mentally Handicapped

The needs of the mentally handicapped children in India can be met to a great extent by legislation, by competent teachers to teach in this area and by aid of psychological and vocational services and therefore capable of dealing with this group.

Legislation: The states of India should enact laws making special education provision for the mentally handicapped. The enacted legislation should provide financial assistance to welfare organisations making special provisions for mentally handicapped pupils. The financial aid is based, as in foreign countries²¹ upon contingencies that (a) qualified clinical examiners shall certify the pupils who are to be classified as mentally retarded and make the necessary recommendations for their welfare, and that (b) specially qualified teachers shall be selected to guide the education of pupils

21. *ibid.*, p. 253.

of this group. Efforts should be made to include such provisions as: (a) organisation of special classes to serve all rural children; (b) transportation of children classified for a special class programme to a special class centre; (c) placement of children to a special class in a boarding home where transportation facilities are not available; (d) providing in-service training to teachers and head masters who are interested in the education of mentally handicapped children; (e) special allowance to be paid to teachers; (f) An Institute of Mental Health should be established to prepare curriculum for different categories of mentally retarded pupils. This institution may also take follow-up service.

Psychological Service: For a psychological diagnosis there are three approaches:²² (a) The developmental history of the child from birth onwards is to be considered *i.e.*, when did the child begin to sit, crawl, stand, walk and talk. His other behaviour, habit formation and understanding have to be studied. (b) The child's mental equipment as revealed in his behaviour and achievement in comparison with the average child of his age is to be estimated. (c) But the more certain procedure is to apply objective tests of intellectual capacities or educational attainment, if the child has had some schooling.

Uday Shankar²³ says that with regard to mentally handicapped the child should receive all possible training in practical tasks: he can be trained to take care of himself from danger, and in some cases to learn some craft or do some to earn his livelihood so that he does not ever remain quite a burden to his parents or guardians.²⁴ The child is to be sent to a special boarding school, because it will be most profitable to him so that he can attain as much proficiency as possible.²⁵ We should follow the example of U.K.²⁶ where feeble minded children, or mentally retarded children or mentally handicapped children, generally, when discovered, are placed by the Local Educational Authorities in special schools. In this State there should be legislation as mentioned earlier to provide such facilities as have been made obligatory by the 1944 Education Act in the United Kingdom.²⁷

(C) Socially Handicapped Children or Delinquents

The socially handicapped usually includes those children who are spoken of as truants, incorrigibles, behaviour problem cases,

22. Shankar, Uday. *Problem Children*, Atma Ram & Sons, Delhi, pp. 16-17.

23. *ibid.*

24. *ibid.*

25. *ibid.*

26. *ibid.* p. 18.

27. *ibid.*

pre-delinquents and pre-truants. This group needs special educational service either in special groups or in the form of guidance from specially trained persons in addition to that given by regular teachers. Among the more seriously maladjusted are the delinquents, who "if not kept busy today, society should be prepared to be kept busy by them on the morrow."

Delinquency: Its Causes and Prevention

The term 'Juvenile Delinquency' is difficult to define. But there is unanimity of opinion with regard to some points, i.e. the term is used to denote certain behaviour patterns of an individual below a certain age, and that these behaviour patterns of an individual are generally viewed as running counter to the prescribed legal declaration of that particular community. Legally speaking, when a child is below 16 or 18 years and becomes the subject of official action, he is termed as a juvenile delinquent. Surprisingly enough, the behavioural content of the term varies from country to country, culture to culture from time to time, and according to the attitudes of people and their social and cultural background. Thus, in many European countries a minor is legally considered 'delinquent' if his breach of the penal code is an offence for the whole population. On the other hand, in U.S.A. it covers a wide range of behaviour. Truancy, smoking in public, drinking alcohol are all public offences. The Indian Penal Code uses the term Juvenile Offence instead of the term Juvenile Delinquency. In India any person who comes in conflict with the law, below a certain age limit, is called a juvenile delinquent. Delinquency is used for a rebellion and an expression of aggression which is aimed at destroying down or fighting in order to change the environment according to their wishes. Juvenile Delinquency is a social problem and indicates a maladjustment of children and their disordered development in the society.

The Police Research Bureau of the Ministry of Home Affairs has reported that the total number of cognisable offences committed by juvenile offenders in India during 1970 was 27,226 as against 20,165 in 1960. The increase of 35 per cent during a decade from 1960 to 1970 indicates that the problem is serious and demands our immediate attention.

Research Studies

Before discussing causes it would be appropriate to report some of the research studies about the causes of juvenile delinquency in India and abroad,

India: Looking into the literature on juvenile delinquency in India one finds studies dealing with the sociological side outnumbering studies dealing with the psychological aspects. Bose²⁸ said

28. Bose G., *Delinquency in India*. In Eissler, K.R. Ed. *Searchlight on Delinquency*, New York, International University Press, Inc. 1949.

"the anti-social behaviour of the child is of no concern to the administrator but to the psychiatrist and psychologist; it is a cognizable offence." Bose recognised that there are crimes which are typically Indian and which spring from the traditional taboos of Indian society. He gave an example of Diwali. He also recognised the relationship between epileptoid states and juvenile delinquency. Recent studies in electro-encephalography point to the same conclusion. This is the psychological side.

With regard to the sociological side four outstanding Indian sociologists namely, Banerjee²⁹ Haikarwal³⁰ Shanmughan³¹ and Uday Shankar,³² did a lot of work. Banerjee laid emphasis on the sex delinquency of women. Haikarwal emphasised the sociological side of crime. Shanmughan found poverty to be an important factor in crime. Uday Shankar found maltreatment of parents and step-parents to be a causal factor of juvenile delinquency.

Western Countries: Literature in Western countries with regard to the sociological side of crime is found in abundance. Reckless confirmed "it is impossible to say just what the causative factors are and what weights they carry". Mahendale's valuable study on adolescent criminals helps us in knowing the causal factors of juvenile delinquency. He studied 4,500 criminals in the age group of 5 to 25. He found the following causal factors:

(1) Home condition i.e. marital disharmony; (2) the irresponsible behaviour of the adolescent. He found that the adolescent fails to realise the importance of his new responsibilities and duties; (3) discontent in agricultural work and other occupations; (4) harsh treatment by parents; (5) loose parental control; (6) poverty; (7) unemployment; (8) indebtedness; (9) bad companionship; (10) jealousy, revenge and intoxication. In short, he emphasises that social factors are responsible for delinquency.

Shaw found social conditions responsible for juvenile delinquency. He found that juvenile delinquents are more in central region than in peripheral zones. The reason is that crowded sports have failed to strengthen unifying and edifying elements.

Burt found correlation between broken home and incidence of delinquency. Carr Saunders found lone home rather than broken home as one of the important causes. Burt also emphasised economic factors; 'one child in six was in want of economic necessities

29. Banerjee, G.R., *Sex Delinquent Women and Their Rehabilitation*, Bombay Bureau of Research and Publications, Tata Institute of Social Sciences.
30. Haikarwal, B.S., *Economic and Social Aspects of Crime in India*, London, George Allen & Unwin, 1934.
31. "An Analytical Study of Delinquents," *J.S.W.* VI. IX, 1948. No. 3 176 184.
32. Shankar Uday, *A Study of Child Delinquency*, C.I.E., Delhi, 1955.

of life.' According to Merrill, poverty and bad social, economic conditions are not the causes of delinquency, but it is the way the individual reacts to socio-economic background. Freud said, "It is quite impossible to understand how psychological factors can be overlooked where the reaction of human beings are involved." Thus he emphasised psychological factors rather than sociological factors as the causes of juvenile delinquency. Sandiford said that it is more than the socio-economic dictum of poverty. Healy and Bronner laid stress on bad companionship. He found that 62 per cent cases were in the company of bad persons. Reckless found these factors are not causes of delinquency but causes of promotion because children coming from rich families also find their way to delinquency. Nolan said that school is another factor for delinquency. He also said that generally public flouting of law is a cause. Bowley found emotional disturbances as causal factors of juvenile delinquency. Alexander found frustration as the basis of aggression and juvenile delinquency. Bronner found low intelligence, and Glueck found feeble-mindedness as cause of criminal conduct.

In conclusion, Burt was right when he said that it is collaboration of internal and external factors which is necessary if we want to find out the causes of juvenile delinquency.

Differences between Delinquents and non-Delinquents

Delinquents have lower I.Q. than non-delinquents. They also suffer from emotional malfunctioning: high defiance, high resentfulness, high impulsiveness, high anxiety pattern, high hostility and resentment than non-delinquents. There are deviations in personal make-up between delinquents and non-delinquents.³³

Deviations have also been found with regard to family and neighbourhood between delinquents and non-delinquents. For example, delinquents have a typical home structure; economic distress and inadequate affection of parents than non-delinquents.

The delinquent has been found a repeater in school. He is a truant and has motivational problems.

Causes of Delinquency

All the above research studies conducted in India and foreign countries suggest that there are two factors responsible for the causes of juvenile delinquency: (i) Primary factors, (ii) Secondary factors.

The primary factors which give rise to juvenile delinquency are weak super ego; physical deformity, low intelligence; lack of security and affection; eagerness to introject parental character and slow

33. *Encyclopaedia of Educational Research*, Macmillan Company, New York, 1960.

or rapid development. In the delinquents the ego or the self is weak. They are usually governed by the pleasure principle and impulses. This *dominance* of pleasure principle will ultimately give strength to instinctual urges and thus there would be lack of independence and weak super ego. The physical deformities present in the individual give rise to inferiority complex which leads him to behave in an aggressive manner as a compensatory reaction. This aggression becomes a defensive mechanism against the dependent and insecure tendencies. It has been found that premature puberty and early arousal of sexual impulses leads to sex offences in the adolescent age. Low intelligence has been found to be one of the causes of delinquency. Delinquents mostly lack understanding, foresight, judgment and ability to see cause and effect relationship.

Recent researches in educational psychology have shown that for a healthy development of a child the most important thing required is the security and affection of parents. Such children who lack affection and security, ultimately develop inadequate and inconsistent relationship with their parents. This gives rise to anti-social and aggressive behaviour. It has been seen that children copy and imitate their parents and take pride in whatever their parents do. Immoralities, alcoholism, and sexual irregularities in parents dispose the child towards the offences automatically. The criminality is thus inherited through experience with parents who are deviants.

Knowledge of physical growth and development indicates that the children whose development is slow or rapid face great difficulty in adjusting with the environment. They are faced with uncomplimentary comments and are usually teased by playmates. Hence, they become anti-social and immoral. Some delinquents show neurotic symptoms which arise from the frustration of sexual impulses. Some delinquents are psychopaths whose abnormal behaviour is largely due to unconscious sexual impulses.

The *secondary factors* giving rise to juvenile delinquency are:

- (1) *Family*: Feeling of dislike, unwantedness or rejection leads to unfortunate personality characteristics and the child runs elsewhere for acceptance and affection. Further, the over-cared, overprotected or overloved child may also tend to show delinquent patterns. According to Burt, the only child, the eldest and the youngest child can show such tendencies if overprotected. When the parent who is loved by a child is a wrong doer, he or she is bound to convert the child to a delinquent one. Unreasonable and harsh or stepmotherly treatment of the child leads to resentment, hostility and unwillingness to conform. Jealousies and rivalries are the result when one child is favoured by the parents in the case of sibling rivalries. Very often, open

accusations of one parent against another due to quarrelling and drunkenness are disastrous for the harmonious development of the child. Poverty of ideals, absence of constructive parental attitudes, to say nothing of omission of sound ethical and religious training, etc., are too obvious to tread the path of delinquency. In families which are called multi-families, where the parents are divorced, where there is another man in the house every month or so, and where the parent is sick and works irregularly and the children are unable to manage their affairs, they thus become delinquent. Children whose brothers and sisters are delinquent may grow into delinquents. Unemployment of parents is also an important factor of delinquency. Children sometimes have to go without food. In such cases the children may resort to stealing or other immoral acts.

The other factors are overcrowding families, lack of accommodation, improper place of living, mental abnormalities of parents, both the parents being in service and high ambitions of the parents which they want to realise through the achievements of their children.

- (2) *School*: Amongst the environmental factors, school comes next to home in shaping the child's personality and in supplying him the tools necessary to meet life in all its phases. It is significant that a majority of children had trouble in school. Many of them were difficult boys to be handled. In the study made by Shankar Uday it was found that the chief participating cause of delinquent behaviour was maladjustment in school. Their percentage was found to be 12.6. This percentage is mainly due to the fact that a large majority of delinquent groups coming from poor families do not go to school as there is hardly any compulsory education, in the real sense, in the country.

School failure is highly correlated with the evidence of delinquency. The mentally dull child, finding school work beyond his powers of assimilation, cuts classes, runs away from the school, joins a gang and indulges in anti-social acts. Such a child is also likely to be lazy, disobedient, inattentive, quarrelsome, a liar, unstable and a bully.

In most Indian schools teaching is made worse by the dominance of the class teacher who rules his kingdom with a rod and whose will is the law. Classroom procedures are generally autocratic, and the chief pupil activity is learning by heart. The principal virtues in pupils are considered to be orderliness, silence and conformity to rules.

Prevention of Social Maladjustment

School administrators and teachers need to be made more aware of the factors that are producing serious social maladjustments. In this section brief mention will be made of those environmental elements that will foster mental health and prevent conduct and personality problems in respect of social maladjustment.

(i) *The Family*

That human relations and the feelings and emotions attached thereto are of paramount significance in the development of a well-adjusted personality and the achievement of mental health has been conclusively proved by research. The family setting is, therefore, a prime source in the development of a healthy personality. The first essential mental health for all children is security in the parental relationship derived from the parent's affection and care of the child. A second essential is the parental acceptance of the child for what he is and parental willingness for him to grow up according to his own patterns.

Many children today, however, do not have these needs met. Due to the change in the structural form of the family from the kinship group to the emphasis on the immediate family, family relations and, in particular parent-child relations, are intensified. The child today is more dependent upon his immediate family for training, care, and affection than was the case in the kinship family group. Yet, at the very time when the child has a greater reliance upon his immediate family, it is increasingly breaking up through separation, desertion, and divorce.

The change of emphasis from the kinship group makes the family more susceptible to advertising, the radio, the cinema, fashion magazines, etc., because of the emphasis given to material success and conformity. The parents want the child's home and his possessions to be as good as those of the neighbours. The child himself is compared with other people's children. The pressure to conform creates the drive to achieve, to get ahead both materially and in social status. But out of this sort of competitive pressure grows a sense of uncertainty, of insecurity, and of inferiority for both the parents and the child. Failure to achieve affects both parents and child and may cause parental rejection rather than acceptance and nurture of the child's potentialities.

(ii) *The School*

At school the child enters another social group made up of adults and of large number of children of different ages. The school is a society which has its own programme and frame of reference to which the child must adjust. The school, however, feels the impact of our changing culture, as shown by the growing

emphasis on the immediate family, the shifting population, parental aspirations for social acceptance and success of their children, and the effects of increasing stimuli due to modern methods of communications. Out of all this grow the popular demand for school personnel to re-evaluate, change, and improve school programmes.

Certain mental health needs of the school child briefly stated in terms of school life are (a) the need for success and achievement, (b) the need for recognition and approval from others, (c) the need for belonging to a group, and (d) the need for adventure and new experience. Certain elements in the school setting have their effect on these needs and the emotional well-being of the child. There is, first, the teacher-pupil relationship in which, for example, the child is, accepted for what he is and helped to experience success or is rejected and made to feel inferior because he does not meet the teacher's expectations.

Programme for Socially Maladjusted

In developing programmes for socially maladjusted children, research has shown that certain principles should be followed. Some of these have been suggested in the preceding pages. They are restated here for the sake of emphasis. The following statements³⁴ will be found vague by those interested in the field of educating and caring for maladjusted children. They should be considered in connection with the task of organising a special education programme in this field.

1. Socially maladjusted children are entitled to the advantage of a special educational programme that will permit them to develop to the limit of their capacities. All children must have the right to develop into self-respecting, useful citizens by the process of public education, and that right must not be abridged by a handicap of any kind which can be eliminated or mitigated through the facilities and resources of the schools.

2. Segregation as commonly defined is not a necessary concomitant of the education of socially maladjusted children. School administrators should realize that an exceptional child may be more harmfully segregated when kept in a regular class which meets his needs than when assigned to a special class which meets his needs much better.

3. In organising and administering a programme of special education for the socially maladjusted school, administrators must maintain a balance between the interests of pupils needing placement in special groups and the interests of the great majority of the school population. When these interests often conflict, the conflict must be resolved for the best interests of all concerned. In general, placement of any child in a special group should not be

34. *Forty-Ninth Year Book. Part II, p. 299.*

made if that child may receive as good or better training in a normal group, even though it may be necessary to give special help and additional services over and above those which are usually provided. Special groups, when organised, should be made as homogeneous as possible with reference to age, sex, intelligence and social maturity.

4. School systems should provide for early identification and early diagnosis of children who are maladjusted. School children become problem cases as a result of experience and at a much younger age than is often thought to be the case. While truants, incorrigibles, and delinquents become acute problems at about the time of adolescence, the years in school previous to that period should be considered years of opportunity. For the school to make definite diagnosis and to institute remedial programmes which will prevent the problem from becoming acute.

5. The education of socially maladjusted children requires a broader basis than that of mere intellectual development. These children often have warped personalities, and consequently, their feelings and attitudes are the object of more concern than their academic attainments. Educational programmes for meeting the needs of the socially maladjusted should be subject to a minimum of regimentation and should have more than yearly opportunities for change. Children who are deviates because of social maladjustment need a chance to develop emotional stability; they need personal, educational, and vocational guidance; they need to experience the sense of security that goes with a socially acceptable personality. Unfortunately, the school does not always bring to these handicapped children the sense of success that might move them to strive for the maximum of cultural attainment available to them.

6. Any programme of education for the socially maladjusted will be considered by the selection of properly qualified and trained personnel. The teacher must have personal qualifications suitable for the task in hand and should have training which is particularly adapted to the requirements of working with problem children.

7. No programme for socially maladjusted children is sound unless it recognises the fact that the behaviour of such children is symptomatic and purposive. Adverse behaviour such as truancy, incorrigibility, and delinquencies are only symptoms of underlying conditions, the roots of which will be found in the environmental life of the child or in some physiological and psychological aspects of his personality. Teachers and school administrators must also recognise that so-called abnormal behaviour is sometimes to be regarded as logically normal. An objective attitude on the part of teachers toward children's behaviour may serve to prevent problem cases from developing.

8. Socially maladjusted children differ from normal children

more in degree than in kind. There is no hard and fast line between normal and abnormal adjustment. Problem boys and girls look no different than ordinary children. Too often problem children are not problems in their relation to society. They are, in fact, only children with problems which they, their parents and their teachers cannot readily solve.

9. Teachers, school administrators, and social workers should not initiate programmes for educating or treating socially maladjusted children without first making a survey to determine the extent and nature of the local problem. Plans for a given school should be made to meet the situation revealed by the survey. Expert advice should be sought and the programme should be built on sound educational principles. Essential personnel should be selected with regard to training and personal fitness for such service. The programme must provide something over and above a regular school programme and contain something of particular value to the maladjusted child. In general, the programme should be conducted for twelve months in the year and carry far beyond the door of the school house.

(D) GIFTED CHILDREN

Importance

Gifted children, with wide range of creative intellect and talent, are an asset to any society. Development of society depends upon, among other things, on the development of children. The ethos of personal achievement and of competitive materialism can be influenced by the creative thinking of children, adolescents and adults. Creative people, young and old, who are endowed with many abilities and characteristics, are trend-setters in a society and it is, therefore, obvious that a gifted child is capable of serving his society in a number of ways which can help the country in developing itself in various ways. All countries and cultures have a certain percentage of population who are endowed with special abilities and high intelligence. The excellence and quality of a nation depends on how this specially endowed proportion of the population is nurtured and how they are used in developing society. The interest in the welfare of intellectually gifted children has been there in all societies from the olden days. It is reported so in ancient books and documents of the world. This interest in gifted children is due to the fact that they can contribute best to the promotion of art and science and can develop science, philosophy, education and mathematics in a variety of ways, thus furnishing leadership roles in various sections of society.

Giftedness is one of the most highly valued of human qualities. High intelligence in a child is a gift from nature which should not be allowed to go waste. Between progress and stagnation in a society, there is the level of intelligence and creativity. This mental

function is to be properly understood so that significant insight is obtained on the psychology of giftedness. The work for counsellors, teachers and administrators has, however, increased on the problem of creative individuals.

The degree of concern on the problem of gifted children is growing. There are legitimate reasons for it. Guiding and growing the potentialities in children is the primary concern of education and no country, however big or small, can ignore this problem.

Due to some unfortunate reasons, there have been some prejudice regarding gifted children in some quarters in the past. They have generally been looked down upon as bespectacled old and angular people who have a strange set of behaviour patterns and who are difficult to understand. All types of names and or titles have been attributed to them. Such assumptions about them have often been misleading and distorted. It has often been said that gifted people are queer and maladjusted and have neurotic and schizophrenic tendencies in them. It has, however, been difficult to prove such assertions. Such an idea about gifted people is more due to misunderstanding. Gifted children are the prize of any civilisation and society.

First studies which have drawn importance to the problem of gifted children are those of Terman. His studies have provided objective information about the psychology and physiology of gifted children. These studies have removed many misunderstandings regarding gifted and creative people. Now it is known, without any prejudice, that a gifted child, is generally more healthier, more attractive, handsome, better developed and in general, to be enjoying a richer and fuller life. After his studies, more and more information is available about gifted children. Their talents, their attributes, their characteristics are better appreciated now. Within the past three decades, selection and education of gifted children has become a major job function of any normal system of education.

Kirk³⁵ reports that in ancient Greece, over 2,000 years ago, Plato advocated proper and special education of intellectually superior children. In the sixteenth century, Suleiman made special efforts to study gifted children. But it is during the last two centuries that a concerted attempt is made to study the complex problem of gifted children. In USA, Europe and other parts of India and Asia, systematic efforts have been made to orient the educational system to the needs and requirements of the specially endowed children. Considerable funds have been earmarked for the promotion of research on gifted children. The interest in the special education of gifted children all over the world has also grown considerably during the last 50 years.

35. Kirk, Samuel A., *Educating Exceptional Children*, Oxford and IBH Publishing Company, New Delhi.

Parents have to understand their sons and daughters are gifted. Failure on the part of parents to appreciate the problems and potentialities of gifted children will be a great loss to society. Failure on the part of parents to understand such specially endowed children will destroy their capacities. Similarly, inability on the part of the teachers to appreciate highly creative and gifted children will result in various problems such as refusal to learn, development of delinquency and symptoms of withdrawal from the class. Better parent-child relationship can exist when a gifted child is not allowed to grow under strains and stresses of prejudice but allowed to engage himself in creative and intellectual thinking. Gifted children should not be allowed to undergo fear to think.

In a democracy or in a democratic philosophy, all children are expected to get the opportunity to grow and to learn whether they are average, bright, dull, retarded, deaf, crippled, delinquent, emotionally disturbed or otherwise. A society, which is based on democratic and humanitarian philosophy has provided education to all children in accordance with their capacities. But towards gifted children, society has special responsibilities to discharge. They should receive attention and care which is due to them so that they grow and develop in accordance with the laws of psychology. The aptitudes and abilities of gifted children cannot be fully developed unless they are placed in an environment which is congenial to them for their mental, emotional and social growth.

For gifted children, there is a problem of exploration in psychosocial excellence. Intellectual excellence serves society in a number of ways. Intelligence and creativity, which are the marks of giftedness, are attributes of a rich personality. Relationship between excellence in society and excellence in gifted children is markedly high and positive. Gifted children have many characteristics and qualities which can be an asset to a society. Intellectually, gifted children represent the upper group on the intelligence scale. From the biological point of view, gifted children initiate and are capable of initiating rich activities which can ultimately prepare them for creative contribution in adult life. There is an intimate sensory-motor and symbolic interaction with time and space in which they live.

Gifted children, when properly educated, make a rich manpower. They are in a position to acquire rich skills and abilities, the presence of which constitutes an additional asset to a society. In an industrialised society, where varieties of skills are required and where inventiveness is very much in demand, a gifted child can be a source of promise to society. An economy in a society can get a boost from the gifts of their intellectual capacities. If a gifted child is ignored in a society, it will lose a gifted adult, which is serious loss not only to the country but also to human civilisation. The importance of gifted children cannot, be therefore, ignored.

Definition of Giftedness

Various definitions have been given to giftedness. This is so because giftedness is due to many talents and abilities. Guilford has postulated as many as 120 different intellectual abilities. One child may be gifted due to various reasons and he may show giftedness in many directions. Kirk³⁶ refers giftedness to any of the following special aptitudes and talents:

the socially talented
the mechanically talented
the artistically talented
the musically talented
the linguistically talented
the physically talented
the academically talented.

Another definition on giftedness, which has been coined in the Fifty-seventh Year Book of the National Society for the Study of Education, is as follows:

"A talented or gifted child is one who shows consistently remarkable performance in any worthwhile line of endeavour. Thus, we shall include not only the intellectually gifted but also those who show promise in music, the graphic arts, creative writing, dramatic, mechanical skills and social leadership."

Another definition has been given by Sumption and Lucking. It runs as follows:

"Those who possess a superior central nervous system characterised by the potential to perform tasks requiring a comparatively high degree of intellectual abstraction or creative imagination or both."

Yet another definition of giftedness has been given by two other authors, namely, Fleigher and Bish³⁷ who have said:

"The term gifted encompasses those children who possess a superior intellectual potentiality and functional ability to achieve academically in the top 15 to 20 per cent of the school population; and/or talent of a high order in such special areas as mathematics, mechanics, science, expressive arts, creative writing, music and

36. Kirk, Samuel A., *Educating Exceptional Children*, Oxford and IBH Publishing Company, New Delhi, p. 39.

37. Fleigher, Louis A. and Bish, Charles, E., "Summary of Research on the Academically Talented Student", *Review of Educational Research*, 29 (December 1959), p. 409.

social leadership; and a unique creative ability to deal with their environment."

The term giftedness has also been defined in terms of IQ. Those with high IQ have been classified by some psychologists into gifted category.

Getzels³⁸ has defined giftedness in the following manner:

"Although the question may be largely a semantic one, there is no doubt that many desirable qualities exist beyond those with an exclusively intellectual form. Are there not some social qualities, say, moral character or psychological adjustment which also might lead us to call an individual gifted, and may perhaps be reflected in superior school performance, to say nothing of excellence in other areas such as public service? Surely the study of such qualities might will be an adjunct to any general and systematic examination of giftedness."

From the above definitions, it is evident that giftedness is a wide term psychologically and does not refer to any single narrow ability. The modern approach to giftedness emphasises the fact that IQ is not the only criterion for giftedness. Since an intelligence test is not all comprehensive to assess all the qualities which endow a person with giftedness, it is not possible, to say the least, to evaluate it by a single intelligence test.

Some psychologists have defined giftedness in terms of cognitive giftedness. Cognition is the process whereby an organism becomes aware or obtains knowledge of an object, a quality, or an idea. According to one psychologist, namely, Guilford, there are two cognitive functions possible. One cognitive mode tends towards retaining the known, learning the predetermined, and conserving what is. The second cognitive mode tends towards revising the known, exploring the undetermined and constructing what might be. Guilford has defined giftedness in terms of two concepts like "convergent thinking" and "divergent thinking." Rogers uses the terms like "defensiveness" and "openness." Thus, giftedness is defined by different persons in different ways.

Incidence

The presence of gifted children in the population of a country is anybody's guess. Although no *cut and dry* rule has been found to ascertain the number of children who are gifted in the population, certain surveys have been made to estimate the number of gifted children in a country. Number of gifted children in particular school population is also not easy to estimate. This difficulty is caused due to the fact that there is no single criterion which can be

38. Getzels, W.J., *Creativity and Intelligence*, 8, John Wiley and Sons, Inc., London, 1962, p. 8.

used as the yardstick for assessing giftedness. Secondly, the problem of giftedness is also influenced by the fact that it is a culturally determined concept also.

There are a few studies which have examined the presence of gifted children in a population. One such study is by Leta Stetter Hollingworth. This author has set 180 IQ and above as the working of giftedness. On the basis of this criterion, the author concludes that there is only one child in a million who is gifted. But, if this high criterion of IQ is lowered, the percentage of giftedness in a population would increase. For example, if an IQ of 115 and above is used as the criterion of giftedness when the Stanford-Binet test is used for testing, the percentage of gifted children in most of the school population is expected to go up by 15 to 20 per cent.

Gallagher has also done some work on gifted children. The author estimates children in various IQ categories. He concludes that there may be less than 1 per 100 school children when IQ of 140 and above is taken in the average community and to over 45 in 100 taking the lowest IQ of 115 in a superior socio-economic community.

Full picture on the number of gifted children in the population will not emerge unless the problem of criteria and validity are fully established. The theoretical rationale of giftedness has to be therefore, fully developed. The problem of "gifted" behaviour has to be first studied systematically. A committee in USA, studying the problem of giftedness, included the following as types of creative products:

1. New theories and hypotheses.
2. Classificatory or analytical concepts.
3. Relationships, formulas, techniques, machines, materials, chemicals and physical patterns.

Considerable research will have to be done to arrive at accurate percentage of gifted children population in India so that the magnitude of the problem is fully assessed in a country.

Identification of Gifted Children

Identification of gifted children is a problem that has engaged the attention of psychologists and educationists all over the world. Giftedness is a psychological and educational problem. There are varieties of giftedness in children. It becomes, therefore, difficult to assess giftedness with the help of a single tool or test.

Terman's model for identifying gifted children was both simple and powerful. He employed group or individual tests for assessing giftedness in children. Children in the top 1 or 2 or 3 per cent in

IQ were called by him as gifted children. It was, however, felt that common intelligence tests represent a rather narrow band of intellectual tasks. Such tests usually assess recall or recognition type of problems. Hence, full range of giftedness in children cannot be measured by intelligence tests fully. Moreover, it is also believed that children who score high on intelligence tests may not necessarily be highly creative also. It was also felt that IQ units may not be necessarily immune to advances in one's understanding of thinking and behaviour. This fact or conclusion is much vouchsafed by result from studies done in the field of cognition, learning and problem solving. There are studies which have suggested that creativity and intelligence might not be closely related. Further, intelligence tests emphasise learning ability and school achievement and may ignore or neglect those psychological functions which are related to creativity. This way of thinking has been emphasised by Thurstone who has stated as follows:

"To be extremely intelligent is not the same as to be gifted in creative work. This may be taken as a hypothesis. It is a common observation in the universities that those students who have high intelligence, judged by available criteria, are not necessarily the only ones who produce the most original ideas. All of us probably know a few men who are creative and highly intelligent, but this combination is not the rule."

Observation, given above, will lead scientists in their attempt to identify gifted children in the school population. Once it is clear that intelligence and creativity may not be found in a child in the same measure, the level of two abilities have to be fully ascertained.

Intelligence tests and creativity tests have been used for identifying giftedness in children. In general, tests of creativity involve the ability to deal inventively with verbal and numerical symbol systems and with object-space relations. Performance on these tests depended not on a single predetermined correct response as is most often the case with general intelligence tests, but on the number, novelty, and variety of adaptive responses to a given task. Getzels has described the following measures of creativity or giftedness³⁹

1. Word Association Test: The test presents the subject with words and each word and as multiple meanings. The student is asked to write as many meanings as he can for each word.
2. Uses for Things: The subject has to write as many different uses as he can for each object.
3. Hidden Shapes: The subject has to identify the complex figures in which the single figures appear.

39. *ibid.*

4. Fables: The subject is given fables whose last lines are missing. The student is required to supply a suitable ending.
5. Make-up Problems: The subject is required to use the information given to make-up as many problems as he can within the time limit.

Scholastic achievement tests have been employed by workers for studying giftedness. But such tests have not been found comprehensive or valid enough to assess creativity.

Efforts have been made to study giftedness from another angle. Kough and De Haon have developed a method for discovering special abilities and disabilities. The authors have listed various criteria to identify special abilities and talents among gifted children. The criteria fall in the following areas of human endeavour:

- (1) Intellectual ability.
- (2) Mechanical skills.
- (3) Physical skills.

Another observation technique called "Guess who technique" has also been employed by them to identify intellectually gifted children in the student population. Another author, namely, Willy has used the following procedure for identifying giftedness:

1. Accuracy and use of vocabulary.
2. Language proficiency.
3. Quick and keen observation and retention of information about things.
4. Early interest in calendars, in telling time, and in clocks.
5. Quality of concentration.
6. The early development of ability to read.

Galagher⁴⁰ has summarised the limitations of various techniques of identifying gifted children:

S. No.	Methods	Limitation
1.	Intelligence Tests (Individual)	Best but expensive. Time consuming.
2.	Group Intelligence Test	Generally good for screening. May not identify those with reading difficulties and

40. Gallagher, J.J., *The Gifted Child in the Elementary School*, Washington : American Educational Research Association, National Education, 1949.

emotional or motivational problem.

- | | |
|-------------------------------|--|
| 3. Achievement Test Batteries | Will not identify under-achieving gifted children. |
| 4. Observation | Motivational problems, emotional problems and children with hostile abilities towards schools. |

The Minnesota Test of Creative Thinking

This test is widely used for identifying creativity or giftedness among school children. Tests have been used in assessing creative thinking from kindergarten through graduate school. The tasks developed may be classified into three major categories like:

- (a) Non-verbal tasks,
- (b) Verbal tasks using non-verbal stimuli, and
- (c) Verbal tasks using verbal stimuli.

Under each of the above headings, various sub-tests have been used by the author. Full description of the test is given as follows:

A. Non-verbal Tasks

It consists of the following sub-tests:

- (i) Incomplete Figure Task
- (ii) Picture Construction Task
- (iii) Circles and Squares Task
- (iv) Creative Design Task

B. Verbal Tasks using Non-verbal Stimuli

It consists of the following sub-tasks:

- (i) The Ask-and-guess Test
- (ii) Product Improvement Tasks
- (iii) Unusual Uses

C. Verbal Tasks using Verbal Stimuli

It includes the following sub-tests:

- (i) Unusual Uses
- (ii) Impossible Task
- (iii) Consequences

- (iv) Just Suppose
- (v) Situations
- (vi) Common Problems
- (vii) Improvements
- (viii) Mother Hubbard Problem
- (ix) Cow Jumping Problem
- (x) Imaginative Stories.

Many more tests have been developed since the above test was published for assessing the creative thinking abilities and evaluating creative growth. Some of the problems included in the tests are as follows:

- (a) Picture Tasks
- (b) Make-up Problems
- (c) Filling-in-Gaps
- (d) Creative Activities Checklists.

Intellectual Characteristics of Gifted Children

Gifted children are endowed with many personality and intellectual qualities. Teachers and parents have provided significant information about mental and personality potentialities of gifted children they are:

- (1) They learn rapidly and easily;
- (2) They display rich common sense and practical knowledge;
- (3) They are logical, think coherently and recognise relationship;
- (4) They have good memory;
- (5) They have good fund of general knowledge;
- (6) They have a good vocabulary;
- (7) They are ahead of their class fellows;
- (8) They are question-oriented;
- (9) They use good and unusual ideas; and
- (10) They are alert, keen, observant and react quickly.

Case studies of the intellectually gifted children have above characteristics in common. Life histories of gifted people have shown to possess many outstanding qualities. Gifted children come generally from homes which have good socio-economic level.

The physical characteristics of gifted children are conspicuous.

It has been found that in physical and general health, gifted children possess better standards generally than an average child. They are heavier in weight and their height and vitality is also superior. Their reactions are quick and they develop fast. They enter school at an early age and in school they are much ahead of their class. Their activities in classrooms are wide and varied. Their interests are also very diverse.

It is reported by Kirk that in scholastic areas, the gifted children are more interested in abstract subjects such as literature, debate, and ancient history and less interested in procedure subjects like penmanship and manual training. Gifted children were found to be less sociable in their interests. On a scale of sociability of play interest almost majority of the gifted children fall in the lowest quartile as compared to average children. It is also reported by Kirk that gifted children are rated above average on character and maturity tests. They are rated wholesome.

The gifted children are found to be aware of their talent and their utilization. Their cognitive processes are rich, their memory superior and their divergent thinking high. They show the process of sensing gaps in problems and are quick in filling missing elements intellectually. They form ideas and are getting away from the main track. They try to break away from the mould and are open to experience. This initiative in them to break away from the usual square of thought into altogether different pattern of thought gives facility to invent. They search, combine and synthesize in their minds. Other attributes of their mental activities are marked by the following characteristics:

1. They possess fluency and have most ideas in them.
2. They possess originality and unusual ideas.
3. They show flexibility in their mental thought process. They are first to find a new way.
4. Their mind is inventive and they invent and develop ideas.
5. Their mind has the power of elaboration by virtue of which they think of all consequences.

They have ability to retain ideas and to call for innovative and constructive thinking. A gifted child may enter the school at usual age, but he learns quickly and is ahead of the class and is liable for academic advancement during his school years. Terman, a psychologist, states that a gifted child is ahead of the class by all means and masters the school curriculum to a point two full grades beyond the one in which he is enrolled, and some are as much as three or four grades ahead of other boys.

Personality Characteristics of Gifted Children

Gifted children have been found to have a rich personality. It has been found that there is positive and intimate relationship between giftedness and personality. It is found that gifted children are more desired, better known or understood, more ambitious and more hardworking. They are usually having strong urge to explore and to create. They are also found to be able to sustain frustration better. They self-initiate learning. Their temperament and motivation are better as compared to average children.

It has also been found by various authors that gifted children are impulsive, more self-confident, appreciate originality in ideas. They are highly interested in aesthetic expression and in meditative or reflective thinking. Other characteristics of the personality of gifted children are described in the following way:

1. They accept order.
2. They are adventurous.
3. They are attracted to mysteries.
4. They have desire to excel.
5. They are determined, discontented, emotional and energetic.
6. They are fault-finders and full of curiosity.
7. They like solitude and are individualistic.
8. They are intuitive, industrious, reserved and self-staters.
9. They shun power, are sincere, visionary and versatile.

Other significant personality characteristics of gifted children as found from various studies are:

1. They have strength of self-image.
2. They can recall easily.
3. They are humorous.
4. They have uneven edged development.
5. They have creative acceptance of oneself.
6. They have greater-awareness in them.

Gifted children are possessed by a purpose which is worthy of enthusiastic devotion. They have high degree of motivation. They have been found to have a sense of psychological isolation and estrangement from others. They have developing values and purpose.

Gifted children are fully capable to use their unconscious. Psychologists have stressed the role of unconscious in giftedness. Gifted children are able to carry precocious thinking successfully. They have high motivation for achievement and are highly sensitive,

resourceful, flexible and willing to get off the beaten-track.

As said above, conflict plays a great part in creativity of gifted children. The bases of conflict is in unconscious. It is said that creative solution and neurotic solution to problems have the same genesis. Unconscious forces, motivating the gifted solution are parallel to the unconscious forces motivating the neurotic solution. As the instructual pressures rise and a neurotic solution appears imminent, the unconscious defence against it leads to the creation of an art-product. The physical effect is the discharge of the pent-up emotion until a tolerable level is reached.

Role of childhood experience in gifted or creative product is emphasized. Gifted or creative behaviour is seen as a continuation and substitute for the play of childhood. The creative thoughts are derived, it is said, from the elaboration of the freely rising fantasies and ideas related to day-dreaming and childhood play. The psychic function and effect of creative behaviour is the discharge of pent-up emotions resulting from conflict until a tolerable level is reached. It is found that a gifted or creative person accepts freely rising ideas whereas non-creative persons suppress them.

Education of Gifted Children

Education for gifted children is one of the important problems to which educators and administrators have to administer themselves. Development and abilities of gifted children has to be attempted through an educational system. For this reason, teachers, counsellors, administrators and others should be familiar with requirements of education for such children. They have also to know the developmental aspects of giftedness so that educational process is geared to the teaching of superior children. Education for gifted children, however, is not an easy task as it involves many agencies and organisations. In a national system of education, provision for the education of gifted children has to be made carefully so that gifted children may not feel frustrated in classrooms on account of want of proper stimulation. Children in a particular class may not have the same level of intelligence. This warrants introduction of special classes for those children who are gifted with high abilities and aptitudes. Good and rich school environment will always help the gifted children to utilize their abilities and intelligence in a proper way.

Kirk recommends three ways to attend to the problem of giftedness. One way is to organize special classes for them. The other way is to provide opportunities for accelerated promotion. Third way he suggests is enrichment in the regular grades.

Regarding acceleration, the author feels that gifted children should be admitted to classes on the basis of mental age and not chronological age. This may also involve skipping of grades for

them. Since skipping of a particular grade may leave a gap in a child's experience, child may be exposed to various educational experiences in a good manner. This method is called telescoping of grades. Extra coaching and or extra classes may attend to this sort of acceleration in learning.

Enrichment is also accepted as a useful alternative to educational system for gifted children. Gallagher defines enrichment method as "the type of activity devoted to the further development of particular intellectual skills and talents of the gifted children. According to Kirk, this enrichment programme in education for gifted children can be run in the following way :

1. Gifted children should be engaged in additional readings and extra assignments.
2. Gifted children should be combined in a group so that they stimulate each other in learning.
3. Gifted children should be allowed to participate in large-curricular activities.
4. Gifted children should be expected to give high results in school performance.
5. Gifted children should be allowed to participate in activities that encourage initiative, independence and creativity.
6. Gifted children should be given a special programme of curriculum to follow in their schools.

Role of early schooling for gifted children is very important. It not only gives early discipline but early training to them to think affectively. This education should sustain curiosity and manipulateness in them. A natural system of education for gifted children should prepare them for victory and success and not for frustration and failure. Gifted children should be encouraged to think creatively so that they work about machines and invent imperative human relations, the capacity for weighing of values and develop consciousness in them to liberate the society from stagnation.

Creative growth should be the aim of education for all children particularly gifted children. Education should lead to think and not merely to memorize.

The education for gifted children at primary and secondary levels have to be different from average children. While acceleration, enrichment and special education may not be necessary for an average pupil, for gifted children it is very much necessary. A special programme of education, especially at the elementary school level, has to be provided for gifted children, who have to be more content either in a homogeneous or in a heterogeneous class or be

allowed to have opportunity for faster coverage.

Since content of schooling is a matter of great importance for the school run for gifted children, the curriculum becomes one of the important areas where requirements of a gifted child should be reflected adequately. Moreover, the curriculum must also reflect the potentiality of satisfying the individual abilities and aptitudes of gifted children. Accordingly, high school curriculum must be wide and comprehensive and be structured in such a way that it provides a wide and reasonable variety of educational experiences to the gifted child.

Kirk refers many adaptations in educational activities of gifted children so as to sustain and stimulate them in the school. Some of the adaptations recommended by him are :

1. Increase the counselling and guidance activities in school for gifted children.
2. Offer extra-curricular activities—school particulars, science clubs, hobby clubs, student government, etc. to gifted children.
3. Advance classes in science, mathematics, English, social studies should be organized for the gifted children. These classes should emphasize on ideas, concepts and relationships and not on mere memory alone.
4. Extra courses should be permitted for the gifted children.
5. Gifted students should be allowed to enrol in nearby colleges and universities for advanced courses in a subject in which they are interested.
6. Special correspondence courses should be initiated for gifted children.
7. Courses for gifted children should be revised from time to time.

Kirk also quotes Dr Conant's recommendations on educational facilities for gifted children. Dr Conant's recommendations are:

1. Expand the counselling system for gifted children. Dr Conant recommends one counsellor for 250 to 300 high school pupils.
2. An individualized programme of instruction based on the abilities and disabilities of the student should be initiated. Variations and options to fit the individual interests and abilities of students should be possible in the course for gifted children.
3. Grouping of students should be done on the basis of abilities.

4. Extra courses should be organized for the gifted children.
5. Summer school for the bright and ambitious students who wish to progress at a more rapid rate, should be opened.
6. Four years of mathematics, four years of one foreign language, three years of science, four years of English and three years of social studies for the able students should be accepted for the gifted children.

It is, therefore, evident that environment of gifted children should be stimulating. The immediate environment—physical, geographical and psychological, should be encouraging and stimulating. In the environment, there should be rich magazines and rich experiences. Environment should be rich and not depressive as depressive tendencies are also likely to hamper healthy growth in creative direction. It should be comfortable and encouraging. Characteristics of healthy environment, in which creative powers of the gifted child can be stimulated are :

- (a) It should be free from serious threats to the self.
- (b) It should encourage willingness to risk.
- (c) It should develop self-awareness.
- (d) It should promote self-differentiation.
- (e) It should be open to ideas.
- (f) It should promote confidence in the perception of realities of gifted children.
- (g) It should encourage mutuality in interpersonal relations.
- (h) It should be reward-oriented.
- (i) It should recognize the talent in the gifted student.
- (j) It should be free from the exploitation of elders.
- (k) It should cope with the anxieties, fears and problems of gifted children.
- (l) It should be friendly, far from coercive. It should be sympathetic and should not be cold and ruthless.

It is evident that the environment in which a gifted child will live should be objective and warm and it should enable him to think and to find his anchors in reality. It should be stimulating but not soft and unrealistic. It should be responsive to the needs and requirements of the gifted students.

Role of Parents and Teachers towards Gifted Children

Parents and teachers have heavy responsibilities towards gifted

children. They should encourage and not discourage them. They should serve as friends and philosophers to them. They should not try to reduce a gifted child to a position of parasite. They should cultivate leadership qualities in them. They should not repress creative needs in them as it may lead to actual personality breakdown. Creativity, by its very nature, requires sensitivity and independence. Parents and teachers should help gifted children to discover their potentialities. They should give them freedom in gathering, assembling, comparing and shifting ideas. They should allow them to understand, communicate and maintain support with others.

Parents and teachers must reduce emotional distance between themselves and gifted children. It can be reduced by participation and understanding. They have to establish creative relationship with them. They have to enter into imaginative relationship with others. They should stimulate their mind and expose them to experiences. They have not to be coercive agents but friendly and relaxed. They have to exploit positive forces of their personality than negative ones. They have to influence their attitudes and actions. They must have warmth to make others feel safe. They should respect the dignity and worth of gifted children.

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LEADERSHIP

Importance

IN every society, there is a great demand for leaders. Every society, for its survival, asks for more and better leaders. The insistence on the demand for leaders is evidently due to pressing needs of the environment. There needs to be talent for leading. Everybody cannot lead and every person cannot effectively handle organized human relationships. Keeping this in view, leadership problem is a matter that concerns every member of society. Leaders try to influence the behaviour of others for attainment of some specified goals and objectives. Leadership behaviour is in demand in various fields of life situations—social, political, cultural, educational, etc. Leadership is, therefore, a very important feature of many spheres of human activity. Leadership can have far-reaching effect on the zeal and activities of the group and can promote or retard activities in administrations, battlefield, industries and in politics.

Groups and organizations of all sorts are liable to survive and succeed only under an effective leadership. Under poor leadership, performance of a group or that of an organization, can be poor. Managerial abilities and military campaigns have succeeded under creative generalship that have been made available to groups and organizations from time to time.

During the last fifty years, the concern with leadership has become more prominent because of the increased demand for creative talent in every sphere of life. Modern organizations and societies have grown more complex. There is requirement for intelligent guidance and supervision which only talented and creative people can give. Highly skilled leadership in society is very much, therefore, required. In managing leadership duties and roles, different abilities, various viewpoints, diverse attitudes and ideas have to be effectively combined so as to integrate and harmonize group behaviour and performance.

Group behaviour in society is inter disciplinary and people-oriented in character. In leadership, this has to be kept in view. Although human relationships take a variety of meaning, in leadership context, it assumes a definite meaning in the sense that it is related to the process of influencing human behaviour in a structured as well as non-structured human situation. The social process, which leads to influence persons, involves considerable interpersonal relationships and leadership becomes essentially a social process. This process effects group behaviour, organizational life and cultural activities of the society. Political orators, business executives, social workers and soldiers are involved in leadership roles.

The leadership process does not involve a leader alone but also others who come in contact with him. In leadership role, therefore, psychology of the group and of the follower is as important to perceive as is the role of the leader. This underlines the basis of dynamics of leadership. The personality of the leader, the personality of the follower and the characteristics of the situation are appropriate starting points for understanding the psychology of leadership.

Capacity to lead others, therefore, is a great skill which many would like to acquire. Such a capacity is very much in demand in the armed forces because it is vital and important to the working of the military machine. Supply of adequate people with leadership qualities becomes an important issue in personnel problem of defence forces. In a military organization, a good leader has to have capacity to establish discipline, to build up morale and to integrate groups of men into efficient fighting machines. It is true also in case of civil organisations. Followership is important in leadership behaviour. Both leadership and followership are complementary and the two cannot be separated. Good men will make use of leadership in an effective manner. The leader has to provide good morale and sustain the influence on the followers.

Observation of commands and acceptance of requests becomes an essential part of leadership role. A good leader is not only able to command well but is able to extract work from his followers to the best of their abilities and aptitudes.

An intelligent leadership, therefore, creates a situation which can lead to positive goals. It does not aim at destroying the individual and his potentialities. The leader does not sacrifice individuals for the sake of trivial gains. The leader applies his qualities, characteristics and skills for achieving group goals and objectives. His interpersonal relationship with others has to be creative. The essence of leadership is interpersonal influence which involves the influence in an attempt to affect the behaviour of the influence through communication. Leadership is generally associated with certain goals and the means to achieve them. Assessment of leadership effectiveness can be done on the basis of positive goals that

the leader is able to achieve in a given amount of time.

Definition of Leadership

Leadership is a very complex phenomena. Attempts have been made by various psychologists to define this term. Many definitions have been given by them keeping in view various leadership roles which leaders have to perform. Some definitions are general and some definitions are specific. Some of the definitions on leadership are presented below:

Robert Tannenbaum¹ and his associates have defined leadership in the following manner:

“Leadership is defined as interpersonal influence, exercised in situation and directed through the communication process, towards the attainment of a specified goal or goals. Leadership always involves attempts on the part of a leader (influence) to affect (influence) the behaviour of a follower (influence) or followers in situation.”

This definition is general in character. It does not confine leadership role to certain goals.

Stogdill² has given the following definition of leadership:

“Leadership may be considered as the process (act) of influencing the activities of an organized group in its efforts towards goal setting and goal activeness. The definition of leadership relates it directly to the organized group and its goal.”

Reuter has defined leadership in the following words:

“Leadership is an ability to persuade or direct man without use of prestige or power of formal office or external circumstances.”

Another psychologist namely Bass (1949) has provided the following definition on leadership:

“Leadership in group discussion is the assumption of the task of initiating, organizing, classifying, questioning, motivating, summarising and formulating conclusions.”

Hence, the leader is the person who spends most of his time talking to the group since he carries out more of these verbal tasks. Sanford has defined leadership in the following manner:

“The leader is that person who is identified and accepted as such by his followers.”

1. Tannenbaum, R. and others, *Leadership and Organisation: A Frame of Reference*, p. 23, McGraw-Hill Book Co., London, 1961.
2. Stogdill, R.M., “Leadership, Membership, Organisation”, pp. 42-23, in *Leadership*, Edited by G.A. Gibb, Penguin Books.

Another definition of leadership is given by Hamons (1950) who states that:

“Leader is the man who comes closest to realising norms, the group values highest, this conformity gives him his high rank which attracts people and implies the right to assume control of the group.”

Beck (1951) has defined the leadership process in the following manner :

“The leader is one who initiates and facilitates member interaction.”

Dubin (1951) has tried to define leadership behaviour as :
“Leadership is the exercise of authority and the making of decision.”

Another psychologist, Cattell (1953), has defined leadership as :
“Leader is the person who creates the most effective change in group performance.”

Cowley (1954) has attempted to define leadership as :

“Leader is one who succeeds in getting others to follow him.”

Another author, Pigor, gives the following definition of leadership:

“It is a process of mental stimulation which, by the successful interplay of relevant individual differences, controls human energy in the pursuit of a common cause.”

Any person may be called a leader during the time when and in so far as his will, feeling, and insight direct and controls others in the pursuit of a cause which he pursues.

Such definition of leadership process may include such group situations as those organized for professional tuition, expert advice, management and the like. Ordway Tead³ has defined the leadership behaviour in the following fashion:

“Leadership is the activity of influencing people to cooperate towards some goal which they find desirable.”

The emphasis in the idea of leading in the definition is upon the satisfaction and sense of self-fulfilment that is secured by the followers of the true leader.

There are several other definitions on leadership which have been quoted by Andrews (1955). Some of the definitions given by him are:

3. Tead, O., *The Art of Leadership: What is Leadership?* p. 20. McGraw-Hill Book Company, Inc., London.

"Leadership is the exercise of authority and the making of decisions (Dubin, 1951)."

"Leadership is the initiation of acts which result in a consistent pattern of group interaction directed towards the solution of a mental problem (Hemphill, 1954)."

Fidler has defined the leadership effectiveness in the following manner:

"Leadership is the individual in the group who gives the task directing and coordinating task-relevant group activities or who, in the absence of a designated leader, carries the primary responsibility for performing these functions in the group."

From the definitions given above the following observations become evident:

- (1) Definitions of leadership are not contradictory but supplementary to each other.
- (2) Each definition has emphasised one task or the other as a function of leadership behaviour.
- (3) Some definitions emphasise authority, others emphasise the task.

There may be difference in emergent, elected and appointed leaders. There may also be difference between formal and informal leader. A leader is at the helm of affairs.

Obviously, there are many conceptions on leadership and each conception provides fresh approach to the problem of leadership. Several kinds of leadership may emerge. Leadership may be demanded in the fields of art, science, philosophy, writing, politics, poetry, speaking or culture.

Group Dynamics and Leadership

Since leadership behaviour is situational in character, the group plays an important role in leadership dynamics. Leader can influence the needs, beliefs, attitudes and actions of people in the group. In turn, group can influence the leader. Structure and function of the group is essential in leadership roles.

A group has psychological properties. A psychological group has been defined⁴ as "two or more people who bear an explicit psychological relationship to another." In a group, members are in a psychological field and these members are in dynamic interaction with one another.

4. Krech, D. and Crutchfield, R., *The Structure and Functions of Social Groups*. p. 368, McGraw-Hill Book Company, 1984, London.

Smith has defined group as "a unit consisting of a plural number of organisms (agents) who have collective perception of their unity and who have the ability to act or are acting in a unitary manner towards the environment."

In a group, there is self-identity and self-discipline. A leader utilises these characteristics for the achievement of group goals.

Fiedler has also tried to define a group. He defines group in the following manner:

"By this (group) term we generally mean a set of individuals who share a common fate, that is, who are inter-dependent in the sense that an event which affects one member is likely to affect all. Typically, the human group shares a common goal; and its members interact in their attempt to achieve this goal. Typically also, the members are rewarded as a group for achieving their goal; they are punished or they feel that they have failed if their group does not perform as expected."

It is indirect that group will be called a group only when two or more people bear an explicit psychological relationship to one another. It implies that for each member of the group, the other members must exist in some more or less immediate psychological way so that their behaviour and their characteristics influence him.

For adequate appreciation of leadership role, therefore, the concept of the group in which the leader functions has to be properly understood. The group is united by a common goal and a common purpose.

Group has its own characteristics. Hemphill⁵ gives the following characteristics of the group:

1. Size—the number of members in the group.
2. Homogeneity—the degree to which group members are similar with respect to age, sex, background and so on.
3. Flexibility—the degree to which the group undergoes major changes.
4. Stability—the degree to which the group establishes rules.
5. Permeability—the degree to which the group resists admission of new members.
6. Polarization—the degree to which the group works towards a single definite goal.

5. Hemphill, J.K., *The Leader and His Group Leadership*, Penguin Books, pp. 224-225, 1969.

7. **Autonomy**—the degree to which the group operates independently of direction of other or larger groups.
8. **Intimacy**—the degree to which group members are acquainted with one another.
9. **Control**—the degree to which the group restricts the freedom of members' behaviour.
10. **Participation**—the degree to which a member takes part in the group's activities.
11. **Hedonic tone**—the degree to which the group membership is pleasant and agreeable to a group member.
12. **Position**—the location of a member within the groups' status hierarchies.
13. **Dependence**—the degree to which a member relies upon his group.

The aforesaid characteristics try to give the dimensions of the group in relationship to role that a leader is expected to play. It would now be worthwhile to consider leadership theories.

THEORIES OF LEADERSHIP

Various theories have been advanced on leadership behaviour. These theories can be classified into the following broad headings:

1. **Interaction Theory.**
2. **Classical Theory.**
3. **Times Theory.**
4. **Psychoanalytic Theory.**

A brief description of each of the above theories is given below:

(I) **Interaction Theory**

This theory considers leadership as a group function. Leadership is expected to emerge in a group as part of a more diffused differentiation of roles by which group members try to achieve group goals and try to satisfy their individual group-invested needs. Leaders in the group are those persons who are perceiving most frequently to perform those roles or functions which initiate and control behaviour of others towards achievement of group goals. Quality of interaction is clearly emphasised in this theory. In interactional process, two primary aspects are important: (1) Cognitive perception and conceptualization, (2) Attachment or aversion. They orientate the leaders and followers in the group. The leader tries to affect the dynamics of the group. He tries to

polarise and energize the group towards the group goal.

The important features of the interactional theory of leadership as described by Gibb are as follows:

- (1) Groups are mechanisms for achieving individual satisfaction and, conversely, persons interact with other persons for the achievement of satisfaction.
- (2) There is role differentiation in leadership and this differentiation helps in the satisfaction of needs of individual members.
- (3) There is interaction between two or more persons. These persons act with each other in the pursuit of common ends.
- (4) There is integration of cognitive perception of the leader with the group.
- (5) Complex emotional relationships are established among group members which, in turn, define a variety of leadership relations.

In interactional theory, the leader and the group are intimately connected with each other. Interaction of the leader, who has personal attributes with group determine efficient functioning of leadership roles. Leadership has to take into account the specific requirements imposed by the nature of the group. Both characteristics of the leader and the characteristics of the group are important in leadership roles.

In interactional theory, there are lots of 'pull' and 'push' aspects in leadership phenomena. In 'pull' type of leadership there is someone in the first and others follow. In the 'push' type of leadership, there are some who dominate and others who submit. Leadership within such dominance-submission relationship may be characterised as the 'push' type.

(II) Classical Theory

In this type of theory the basic leadership is explained in terms of great man theory. According to this theory, it is asserted that particular individuals are naturally endowed with characteristics that cause them to stand out from the many others. These intellectually and socially gifted people are able to lead, guide and direct the majority. They belong to the class of divine rights theory of beings. On the basis of this theory, leaders are endowed with insight and unusual foresight by virtue of which they bring social and intellectual changes in the society. Nature brings such intelligent people into society and it is their responsibility to lead their society.

(III) Times Theory

According to 'times' theory, a leadership behaviour is a function of the given social situation. In each society, at a particular time, there are needs, aspirations and problems which have to be fulfilled. A leader in such a society has to take the responsibility of fulfilling the needs, aspirations and problems of the group. Such leadership role emphasises certain qualities in the personality of a leader who can take the leadership at the critical time. Such a leadership will be valid and good only for that particular situation. The unique needs of the group are met by the unique qualities of the individual.

(IV) Psychoanalytic Theory

Psychoanalytic psychologists have advanced their own theory on leadership behaviour. They treat leaders as the father-figures for the individual member. The figure has energy, strength and vitality. It has power and force. The leader serves as a perfect focus for the positive emotional feelings of the individual. All members try to identify themselves with this father-figure. Leader is treated as the ideal object for father-figure. For transference also he is an ideal figure. People try to submit themselves before the leader. This submissiveness is born out of the feeling of emotional surrender towards the leader.

Father-figure is not usually associated with parental figure. People want to experience in the leader an emotional experience which is satisfying to them. At times, they may add magical charms to the leader and it may end in many ritual practices of implicit obedience in the leadership of the leader. The follower may try to identify with the individual beliefs and expectations of the leadership. These leaders get tremendous powers and following. However, the leader has to be really great to sustain expectations in people for a long time. Leaders can have tremendous powers for a short time in special group circumstances. Examples of Roosevelt and Hitler are illustrative.

Types of Leadership

Leaders can be broadly classified into the following types:

(i) Authoritarian Leadership

The authoritarian leader is one who exercises more or less absolute power than the democratic leader. The authoritarian leader is more powerful and has a strong way in determining policies of the group. He may consult others in day-to-day activities, but he alone will shape the goals and aspirations of the group. He advises from first stage to the last stage when an activity is in progress. He directs the activities of the group. He can be

extremely punitive and accept or reject contributions of a member according to his own fancies and wishes. His say in matters may be final.

The authoritarian leadership is one-sided and arbitrary at times. The leader deliberately develops the absolute authority in him so that others may not become contenders to his powers. He does not allow the change in a group for the sake of change. He imposes his own discipline in the group and reinforces and protects the leadership from being destroyed from the onslaughts of other members.

In the authoritarian leadership, an individual's contribution is little. A member cannot set goals for the group. His advice may or may not be accepted by the leader. An authoritarian leader tries to impose his views, his ideology and his personality on the group. It has been found that work morale of the group under authoritarian leadership gets dwindled in due course of time.

Since authoritarian leadership is self-directed, the leadership does not encourage intercommunication among the group members. The leadership tries to filter down the instructions and ideas to people down below. The group is conditioned to look at the leader always with the result that he increases the dependence round him which promotes a sense of indispensability in him. The leader develops his own style of leadership and he breeds it in the group.

Since authoritarian leadership is one-sided, it ensures little changes for the individual's development or for each member in the group. There is less opportunity for the development of close interpersonal relations among all group members.

From the spirit of this leadership, there is a definite hierarchical organisation in an authoritarian leadership. The leader is at the helm of affairs and various stages of authority are looking at him in support of approval and approbation. If the atmosphere becomes too individual and personal, the group morale in the organisation may become too dismal and disappointing.

(ii) Democratic Leadership

Democratic leadership does not revolve round a single individual. It draws strength from the group as a whole. The democratic leadership can also enjoy the same degree of power as is enjoyed by the authoritarian type. But the nature of role of a leader in a democratic leadership changes a lot. Moreover, the group structure in a democratic leadership is also different.

In a democratic leadership, the group follows a democratic philosophy. The dignity of the personality of each member is respected. Individual contributions are incorporated in group goals and each member of the group tries to work in harmony with members. The leader in a democratic setting tries to accomplish

his political ideas through group effort. Every one in the group considers himself as good as the next man. There is no power of force. Each member is given claims and prerogatives in the group. He is treated as free and equal. The unique worthfulness of each personality is taken for granted. There is essentially a spiritual equality in the group. Democratic leadership stresses upon the individual personality as the ultimate seat of all values.

In the midst of democratic leadership, there is fear of one possibility, the prevalence and danger of mediocrity and uniformity. It may not cultivate persons in the direction of selfhood, vision and achievement.

Krech and Crutchfield⁶ have made the following distinction between authoritarian and democratic leaderships:

Authoritarian	Democratic
1. All determination of policy by the leader	1. All policies a matter of group determination, encouraged and drawn out by the leader.
2. Techniques and steps of attaining the goal dictated by the leader once at a time.	2. Activity perspective given by an explanation of the general steps of the process during discussion at first meeting. Where technical advice was needed, the leader tries to point out two or three alternative procedures from which a choice could be made.
3. The leader usually dictated the particular work task and work companions of each member.	3. The members were free to work with whomsoever they choose, and the division of tasks was left up to the group.
4. The leader was 'Personal' in his praise and criticism of the work of each member, without giving objective reasons. He remained aloof from active group participation except when demonstrating.	4. The leader was 'objective' or 'fact-minded' in his praise and criticism and tried to be a regular group member in spirit without doing too much of the active work.

6. Krech and Crutchfield, "Group Morale and Leadership", *Theory and Problems of Social Psychology*, p. 427.

(III) Laissez Faire Leadership

Here, the leader is only a stimulator and provides mainly materials and information. The leader tries to exercise a minimum of control. It is stated that under this type of leadership more successful results will be produced.

This leadership does not mean absence of leadership. It implies a person who stimulates every one and involves every one in the group task. It is generally seen that in *laissez faire* leadership, the group works progressively but slowly. There is considerable activity much of which can prove ultimately unproductive. Since there is no precision in activity, time is lost in this process of leadership. The group members are generally on their own initiative and they tend to go backward and forward in the midst of flow of ideas and suggestions till a correct solution is hit upon. Consultations and exchange of thoughts take a lot of time in this activity.

The growth of the group is more due to the individual activity of the group members than by the exclusive efforts of the leader. There is more feeling of unity and harmony within the group. This feeling is also seen in members in a democratic leadership. This leadership ensures personal growth and does not block personal development. Since there are no sharp boundaries in the group, uncertainties from the outside may influence the behaviour of group members. United front may not emerge in the beginning, but as the discussion goes on and members start arriving at the goal, the front becomes more cohesive and determined and the individual needs become integrated with the organisational goals. The quality and superiority does not remain the same from time to time as the solution is obtained through trial and error. This leadership is evident in very common and workable ways where the person directs the group goal in an indetermined fashion.

Personality Attributes of Leadership

In leadership behaviour, personality of the leader is important. Gibb is of the opinion that there are indications that certain traits are frequently found to characterise leaders of various types in a variety of situations. Leadership is correlated with the personal attributes of the leader as perceived by the followers. Some studies have emphasised generalisation of attributes in leadership. Studies were undertaken to study various leadership roles under eleven traits such as: order, ideas, smart, friendly, liked, empathy, looks, sports, swimming, good influence and bad influence. The results of the study suggest that different roles required different personality attributes. Personality attributes may play a part in understanding leadership. Some writers, after doing some research, concluded that there is no reliable evidence concerning the existence of universal leadership traits. Trait approach has not been very much liked by some psychologists for measurement of personality traits of

leaders. Stogdill,⁷ after examining a large number of leadership studies aimed at isolating the traits of effective leaders, comes to the following conclusion: "The qualities, characteristics and skills required in a leader are determined to a large extent by the demands of the situation in which he is to function as a leader."⁸ This is called as the situationist approach to leadership behaviour. Other studies have also been undertaken to evaluate this problem from time to time. Tead reports a study on leadership qualities that are necessary for leaders. He has, for convenience, classified the qualities into various headings such as:

- 1) Physical and Nervous Energy.
- 2) A Sense of Purpose and Direction.
- 3) Enthusiasm.
- 4) Friendliness and Affection.
- 5) Integrity.
- 6) Technical Mastery.
- 7) Decisiveness.
- 8) Intelligence.
- 9) Teaching Skill.
- 10) Faith.

Krech and Crutchfield have also mentioned the following personality characteristics in leaders:

- 1) Resonant voice.
The voice must reveal sincerity, goodwill and kindness, determination, conviction, strength, courage and abounding happiness.
- 2) Leaders must have insistent need for dominance, power and prestige.
- 3) Leaders must have skills in interpersonal relationships.
- 4) Leaders must have high intellectual abilities and fund of expert information and technical competence.
- 5) Leaders must have techniques of handling people.

Other studies have also been done from time to time which have been surveyed by Stogdill. He reports that leaders have personality attributes which distinguish them from non-leaders. He found leaders to be taller in height. Goldwell and Welliman found girl

7. Stogdill, R.M., "Personal Factors Associated with Leadership: A Survey of the Literature", *Journal of Psychology*, Vol. 25, p. 63, January 1984.

8. *ibid.*, p. 68.

leaders average in height. Among leaders, they were bigger and heavier. Studies by Bellingarth, Gowin and Patridge and Zeleny also support the same view. Bellingarth has found that leaders had better health. Patridge found boyscout leaders better in appearance. Regarding intelligence, it has been found that leaders are more intelligent. It has been reported that leaders and prospective leaders have higher intelligence score than non-leaders. There are other significant studies on the subject too. Leaders have been found to be better adjusted, have higher will-control, are more dominant, are more talkative, more humorous, have more knowledge and better institutional adjustment.

U.S. Army has carried out a number of studies on leadership qualities. They have come to the conclusion that leaders should have the following characteristics.

1. Perform professional and technical speciality.
2. Know subordinates and show consideration for them.
3. Keep channels of communication open.
4. Accept personal responsibility and setting an example.
5. Initiate and direct action.
6. Train men and a team, and
7. Make decisions.

Other studies carried out by the American Institute for Research have discovered the following qualities in leader:

1. Should have supervising personnel.
2. Should have planning, initiating and directing action.
3. Should handle administrative details.
4. Should accept personal responsibility.
5. Should show group belongings and loyalty to the organisation, and
6. Should perform professional or technical speciality.

A number of studies on leadership qualities have been conducted. From the studies undertaken, three factors have been identified:

- i) Intellectual Penetration,
- ii) Strength of will, and
- iii) Soundness of feeling.

In other words, the old threefold functions of the mind namely cognition, conation and affect have been deducted.

The Components of Leadership

Leadership is supposed to be associated with the following components.

- i) Interpersonal Influence.
- ii) The Communication Process.
- iii) The Situational Dynamics.

Boring has described the following attributes that a leader should possess. These attributes have been discussed in the special context of military leadership. These qualities may hold good in civilian life as well at times. These attributes are:

- 1) Authority:
- 2) Personal characteristics and attitudes. It includes:
 - i) Competence.
 - ii) Industry.
 - iii) Responsibility.
 - iv) Decision-making.
 - v) Self Possession.
 - vi) Integrity.
 - vii) Teaching Ability.

The leader is expected to discharge certain roles towards his men. Leader's personal qualities produce a great impact on the follower's behaviour. A leader should look into the following requirements if he wants to obtain loyalty from his men.

- i) The leader should give personal recognition to every person who works under him.
- ii) The leader should praise the work done by the follower.
- iii) The leader should encourage rather than criticise.
- iv) The leader should be emphatic and clear in his views and instructions.
- v) The leader should convince his men by reason rather than by power and authority.
- vi) The leader should train his men to expect surprises and reverses.
- vii) The leader should adequately protect his men from over-strain and over-fatigue.
- viii) The leader should inculcate right attitude towards success and defeat, life and death and health and ill-health.
- ix) The leader should plan the goals for his men and introduce activity which will be useful for group morale and group goal.

- x) A good leader should adapt himself to circumstances of a situation and train his men to do so.

From the above description of the qualities of leadership, the leader should, it becomes obvious, be a symbol of hope and strength and he should lead his men to higher accomplishments. The leader has to look after his men and they will be loyal to him and will give their best to him and to the organisation which they are serving.

Selection of Leaders

Various methods of selecting leaders have been devised in various countries. It is felt that no rigid system of selection of leaders can be suggested as the essential characteristics of leadership have to vary from one situation to another and in each situation, the pattern of personality make-up may be different. The qualities of a good leader will vary to some extent with the character of the men to be led and the nature of the job. The particular situation in which leadership is wanted has to be kept in mind. It is not possible to get a versatile leader who will be able to do all jobs for all men. Army General Classification tests have been devised in USA to select leaders from the general population. These tests emphasise that leaders should be intelligent and alert.

Qualities like initiative and responsibilities have been tried and utilised by German psychologists for identifying leadership traits. There are possibilities in such a method but leadership has to be considered as something greater than ingenuity in meeting emergencies.

Auren Uris has described a method of leadership assessment by emphasising certain qualities which the author thinks correspond to leadership qualities. The tests, developed in this process, measure the following qualities:

1. Objectivity.
2. Understanding of People.
3. Communication-mindedness, and
4. Use of Authority.

Questionnaires, having the aforesaid qualities, are given to people and their suitability as leaders is evaluated on the basis of score obtained by them on the questionnaires. High, low or medium scores provide an index of the measure of leadership qualities in the person.

Fiedler has described sociometry tests as tools for leadership measurement. Sociometric studies have made important contributions in studying the problem of leadership. The predictions on

leadership are based on rating of men who perform highly similar tasks and are assessed on their behaviour by their peers. Ratings of these types have been useful for various purposes.

A good executive skill is not identical with leadership. Management is more than leadership. It may include non-imaginative tasks like routine administration, etc.

Terman's studies on leadership assessment have made significant contribution on selection problems of leaders. Terman is believed to have observed that strength and clarity of leadership increase as "group spirit" increases and group goals had greater clarity. He pointed out that it was absolutely necessary to ascertain the criteria of leadership first before any careful attempt is made to identify leadership qualities:

In the measurement of leadership qualities, some psychologists have emphasised situational determinants. Work of Gibb is of particular importance. The assessment of leadership qualities has become particularly useful and purposive due to advance of personality research. It has now become possible to use measures of meaningful, factorially independent personality traits.

Other measures of leadership assessment have also been tried by other psychologists. Bass (1949) has found a correlation of 0.93 between ratings on leadership and the amount of participation in groups. Borgatta and Bales report (1956) that high ratings on leadership by group members tend to be associated with high rates of interaction initiation.

Some studies have shown that in the reason task, leaders ask for information or facts significantly more often than non-leaders. Further, Shaw and Gilchrist (1956) found that leader rank and the number of written communications sent were positively related and that the major source or the difference for leaders was communication about organising the group and giving factual information.

Leaders have been found to display such behaviour characteristics like organise the group, solicit and integrate contributions and propose courses of action. A high rate of participation would not be necessarily associated with these behaviours.

A leader tends to have a high rate of participation in the discussion, he is task-oriented, attempts to specify the problem, to suggest courses of action, to seek out the members' contributions, to integrate these and to propose solution in the attempt to secure consensus in the group.

In various countries, lot of research has been done on the subject of assessment of leadership qualities. Methods adopted by these countries can be classified broadly into two:

- 1) Projective Methods.
- 2) Non-Projective Methods.

1. Projective Methods

In projective methods, non-structured psychological tests are used for assessing the qualities of leaders. Tests are projected on the screen and the candidates are required to give their responses to situations which are shown to them. Pictures are shown to them and they are required to construct stories. Personality qualities are ascertained from them.

2. Non-Projective Methods

In this method, intelligence, aptitude and personality tests are given to candidates. These tests may be either verbal or non-verbal. A battery of tests, which have been standardized on the given sample, is used on a group and on the basis of performance on these tests, performance profile is obtained for each candidate and the suitability of the candidate for leadership roles are ascertained.

Biographical questionnaires have also been used for assessing some leadership qualities. Interviews are also used for assessing leadership qualities in candidates. The validity and reliability of interview technique would depend on the degree of experience and objectivity with which the interviews are held by people.

Training of Leaders

Leadership training is an important task in any society. There are lot of theories and controversies in leadership training and management theory. The orthodox training doctrine holds that the leader must be the brain of the group. He is expected to plan, direct, coordinate, supervise and evaluate work done by members of his group. This theory emphasises that leader must be able to self-direct group effort which will help the members to contribute creatively and constructively to the task. The two theories emphasise two philosophies of training programmes on leadership.

Learning theory on leadership training has been advocated by some psychologists. Leaders are taught what they can learn and there is special emphasis on the problems of learning directly from experience, from knowledge of acquaintance which is in contrast to more intellectual kinds of learning.

A few leadership training studies have been undertaken by psychologists. In these studies, the problem was to tap different aspects of group creativity. In these studies it was found that the relationship-oriented leaders tended to perform better in groups which they describe as pleasant and relaxed. The task-oriented leaders had to perform better in groups which they describe as relatively tense and unpleasant.

Some leadership training programmes give instruction in administrative procedures, in organisational policy and such various other fields as accounting, cost control and legal responsibilities of the organisation. These programmes are primarily designed to increase the individual's leadership skills.

Various methods of leadership training have been developed. One method is called sensitivity or laboratory training method. In this method, opportunity is given to members to explore their own motivations and reactions. Laboratory training methods potentially provide one important avenue for introducing the individual to leadership situations in which he can perform well and to those in which he is likely to fail.

Leaders in training programmes are expected to modify some behavioural and attitudinal aspects of personality. Organisational climate has to be conducive to new behaviours and attitudes. Laboratory training may assist the leader in developing a more favourable group climate and more positive attitudes. Trainee has, therefore, some effect on other trainees and on his group.

Leadership training programmes can either be designed to change the trainee's attitude and behaviour in the direction which will make him more task-oriented, managing and directive or in the direction which will make him more human relations-oriented permissive and non-directive.

Leadership training is an important activity in a democratic set-up. In democracy, one does not believe in the statement blindly that leaders are born and not made. People have to be trained for leadership in government, in business, in education and in all sorts of organisational activity. However, success of a person in a leadership role and capacity would depend upon the inherent capacity that the person has. It is believed that every person has some capacity which can be harnessed in one way or the other in group activity of various sorts and types. Every normal person has some inherent features of his personality upon which skills and attitudes can be built up.

Leadership training is very important in an industrialised society. Industry has to face and meet the problems of foremen and supervisors. Business has the problems of executives and office managers. Similarly, government has the problem of having administrators in offices. Universities and colleges similarly need leaders who can run them.

There are a few obstacles in the training of leaders. They are:

1. Leader may not be well disposed to training.
2. Leader's attitudes may not be oriented to additional training.

3. Leader's personality may not be amenable to training.
4. A leader may fail to adjust himself in a new leadership role.

Leadership training experiments have revealed much significant information. Bavelas has found that personality traits of leadership are not the most significant determining factors in how successful the leader is. In a period of three weeks, leaders who had been poor leaders for years were converted into good leaders.

In leadership training, role playing has been emphasised as a method in leadership training. Skills are developed by learning through doing. The trainee is asked to act out a role which stimulates to a real leadership situation. This technique has certain advantages. It gives the leader a new perspective on his roles. It also enables the leader to have better insight into his leadership roles.

In a military organisation the training of leaders becomes all the more important. A person who has ability and ambition can become a leader. It is also felt that leadership improves with experience and as such it can be learned if the person has required aptitude and enough motivation. Leadership competence can be required with intelligence, motivation and practice and this competence can be a function of leadership training.

From the foregoing pages it can be concluded that training for leadership is an accomplished fact. The objective of most of the leadership training programmes is to stress technical mastery and executive skill. It is generally felt that the common task in all training situations on leadership is to vitalize and harmonize the desires and motives of the led.

For achieving the objectives of leadership training Tead⁹ emphasises the incursion of five elements:

1. A knowledge of the general characteristics of human nature.
2. Self-knowledge of one's own unique combination of qualities with their varying degrees of strength and weakness.
3. A working grasp of the right attitude to possess in dealing with people.
4. An ability to apply all of this knowledge to the mobilising of energy and enthusiasm for the special objectives of the organisation.

9. Tead, O., *The Art of Leadership: How to Train Leaders*. pp. 272-275, McGraw-Hill Book Company, Inc., London, 1935.

5. Deliberate efforts at broadening of the total personality in a cultural direction.

In the end, it would be appropriate to state that there is a demand for leaders in modern society. It is said that people have a desire to be led. It is this earnestness of people to be led that adds responsibility of leading. Keeping this in view, it has become necessary to be precise about what is leadership. Activity of leading can be better understood only when conception on leadership is clear. The problem of exercising leadership in various walks of life has to be dealt with in full earnestness. The type of influence that the leader has to exert on others is equally to be defined and leadership calibre has to be fully appreciated.

Leadership is supposed to have certain objectives and the success of a leader will depend on the type of such objectives. Leadership is not a matter of hypnosis, blandishment or salesmanship. It requires definite motives, impulses and efforts which the leader has to cultivate in himself. Leadership is known by personalities it enriches. The qualities, necessary in leaders, have been stated in numerous ways and the achievement and cultivation of those objectives become the sole purpose of any leadership programme. Physical qualities are as important in leadership behaviour as are mental and personality qualities. The leader has to be an executive. He must possess technical excellence, must be sharp and decisive; imaginative and must have a sense of humour.

Leaders are meant to lead the followers and their methods and manners of leading have to be precise and appropriate. They must have the capacity to project themselves in action with competence and confidence. They must free their followers from the feelings of emotional instability, fear and inferiority.

In a democracy, the need for leaders becomes all the more necessary. No democracy, can live without leaders and no leader can be truly great without democratic principles. Leadership in democracy has to supply excitement and exhilaration. It is vital to a democratic society. This being so, training of leaders becomes an important commitment on the part of society. Society cannot attain emotional stability without training leaders in a proper way as it is these leaders who will give stability to society.

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ADOLESCENCE

Importance of Adolescent Period

PERIOD of adolescence is the most crucial period in the life of human beings. Adolescence is the time when the surge of life reaches its highest peak. The adolescent's life is, or might be, full of hopes. The adolescent is eager to interact with new experiences, to find new relationships to examine resources of inner strength and fathom the strength of inner ability. The adolescent tries to have freedom to think and set his own goals and discover means to achieve them. The adolescent wants to have more freedom to enjoy. Although he is not fully mature to shoulder the responsibilities of life, he enjoys life in youthful dreams. Love and power become a strong motivating force in life. An adolescent lives in a lush season and it falls between the spring time and the summer of life. Adolescence is a time when boys and girls feel the joy and pride of growing up. This joy is felt from within and without. However, there are many restraints that keep him under control. These controls come from home as well as society. Adolescence is a time also of great tension. It is necessary for the young person to behave in a right manner and establish himself and obey the rules at home and outside. No matter how much help an adolescent is given, he is still dependent on others. The adolescent's task is not simply one of interacting with the external environment or with other individuals but one of developing his own potentialities. He reaches his limits. He tries to explore his role in the world in which he lives.

Characteristics of Adolescent Stage

Jersild has emphasised the following characteristics of adolescent stage:

1. Firstly, the adolescent strives to grow up, to be big and yet also to have some of the security that goes with being little.

2. Secondly, there is something radical about being an adolescent, yet also something conservative.

3. Thirdly, the adolescent, if able to draw upon his resources, has a great capacity for flexibility, yet he is also in many ways, a rigid person.

An adolescent's problem of development is of basic nature. If he is warmly accepted at home, he will feel happy and emotionally secure. If he moves into a group of peers dominated by youngsters he is likely to have different values. Other factors can also influence his behaviour. A good home may do good to him and a bad home may affect his social and mental adjustment. Healthy attitudes in an adolescent are necessary. He can stand up better to problems of the world in such a situation. If he is uncertain of his worth, there can be lot of problems for him.

Adolescents should be allowed to grow according to their own interests. Adolescents want freedom and activities, they want to enter into spontaneous relationships with other persons. They want to be powerful and ambitious. If environment is not very congenial for growth, they may develop many dislikes for the things around them. They show a need for affection and attention. Rejected adolescents are likely to encounter difficulties in many ways. They may not learn to bank on their own worth or to feel confident about their own resources. They may show a highly competitive streak, as though they continually need to prove themselves by superseding others.

Need of Psychological Development during Adolescence

Adolescent's personality is a result of many forces. Their total personality is the sum total of attributes and qualities of heredity and environmental factors which operate together on the lives of these individuals. In the integration of adolescent's personality all conditions and basic abilities interplay their part. They give a sense of 'self' or 'personality' to them.

Adolescents have to conform to the laws of society. Deviations from social norms will, in a big way, expose them to trouble. For a proper adjustment, they will have to learn to make a continuous adjustment with persons and environment. This learning will give them a "style of life". To understand the personality of adolescents, an overall view of their interests, feelings and abilities will have to be taken in view. It is not only their personal conduct that is of importance but also the aspirations and dynamics of their underlying behaviour. The development of personality in the adolescent has to be marked by a high sense of consistency and it has to show a high sense of adjustment and flexibility. While behaviour may change slightly from year to year, there will be a common core of habits and ideals which will give persistence to their views and to their way of life. Adolescents will meet many experiences

and each experience is important for their life goals. Experiences will build up the foundations of their personality and character. Under normal conditions, a strong current of continuity will persist in the life and behaviour of individuals.

Actual development of adolescents will depend on the quality of their heredity and the environment in which they live. Heredity will give the limits for growth. Environment will give the change for growth. Heredity will bring out characteristics of growth while the environment will give maturity and significance to the process of development.

From various stages of physical growth, adolescents will show different rates of development. While the pattern of growth is likely to be affected by the heredity, attitudes and ambitions will be determined by the quality of environment. While heredity is, during the adolescence period, important for growth, environment will play direct and indirect role in influencing the personality.

Uncongenial atmosphere is, however, likely to injure the development of adolescents growth. Emotional atmosphere may bring certain deviations in development, if these experiences are persistent. Emotional disturbances may be due to bad environment. Maladjustment, delinquency and emotional disorders may also be caused if adolescents are made to live under tension, upheaval and neglect. In clinical reports, dealing with maladjusted individuals, there is evidence that brings out the fact that those adolescents, who are maladjusted and need special help, have often lived for a long childhood period under disturbed conditions.

Home environment is also very important for the growth of personality of adolescents. Parents play an important role in determining the development of physical and psychological growth in adolescents. Attitudes of father and father-figures affect behaviour tendencies among adolescents. Anderson has found that certain behaviour patterns and personality characteristics, that adults manifest in their interaction with children, are likely to persist from year to year. They colour the ways in which the adults relate themselves to children. Pattern of attitudes among parents determine the tendencies and attitudes among children. The degree of self-consistency about an attitude or way of life adopted by parents, will influence growth during adolescence in a big way. This will give adolescents a powerful motive to maintain a consistent style of life as they will build a logical and coherent philosophy towards life. While trying to maintain consistency in behaviour, adolescents will not fail to modify their attitudes in the light of experiences and happenings that occur round them. They will develop a selective way of life. Their memories and attitudes may not be easy to manipulate. They will give greatest weight to plan ideas and ideals. They will have their own habit systems. They will try to keep their own image in the forefront.

Since adolescence is still a formative stage of human life, adolescents will show a great capacity for change. They will have flexibility. Adolescents, who are emotionally disturbed, also show capacity for growth and change. They are liable to modify themselves under congenial conditions of environment. Under psychotherapy, they may change their views and attitudes. Since adolescence stage is full of growth, and since growth implies change, some adolescents may show personality problems. They become anxious, suspicious, defensive and aggressive if there is no suitable change in the environment. It may distort their views on life. They may become hostile. They may become bullies and vandals. They may become delinquents. They may become wantonly reckless and careless. It will endanger their safety or the safety of others. Proper environment and education is necessary if negative attitudes are to be eliminated from their mind. One of the important aspects of adolescent development is the type of philosophy that they accept for themselves. This philosophy will sustain their system of activities. It will mobilize their personality and mind and give them a proper sense of ethos. It will give them technical and ethical vigour.

Anxieties and perplexities will create strange feelings in them. They may generate fantasies. They may bring a great deal of unhappiness and tenseness in them. They may defeat and disappoint them. Adolescents will feel uncertain of themselves. They may accept themselves or they may reject themselves. Anxieties and worries can bring many weaknesses in them. They thus waste their energy in gloom. Their abilities are likely to be wasted out.

Adolescents have to develop insight into their abilities and have to grow realistic perceptions in them. They will, thus, be able to make real distinction between the 'self' and 'idealized-self'. This distinction is necessary in order to develop proper sense of maturation in them.

Psychological Characteristics of Adolescence Phase

Behaviour of adolescents is marked by certain reactionary characteristics which is the hall-mark of that age. Adolescents may show envy and jealousy. They may be craving for attention and praise. They are eager to seek the company of others who will praise them. Their behaviour shows after effects of praise or criticism in a marked way. A little criticism by others may set them off their balance. A little praise will make their heads cloudy and dreamy. Their reaction to failure and rejection are very much pronounced. The concept of acceptance and rejection helps them to throw light on the psychological currents from which adolescents can get affected. They may not be able to formulate a situation very clearly.

Adolescents may show different degrees of behaviour traits like

courage, aggressiveness, joyousness, cooperation, feeling of friendship, etc. Within all adolescents, there is a hard core or nucleus of temperamental qualities. These qualities are influenced by the dynamic forces of growth. Since they are young and enthusiastic they have considerable resources and lot of resilience in them.

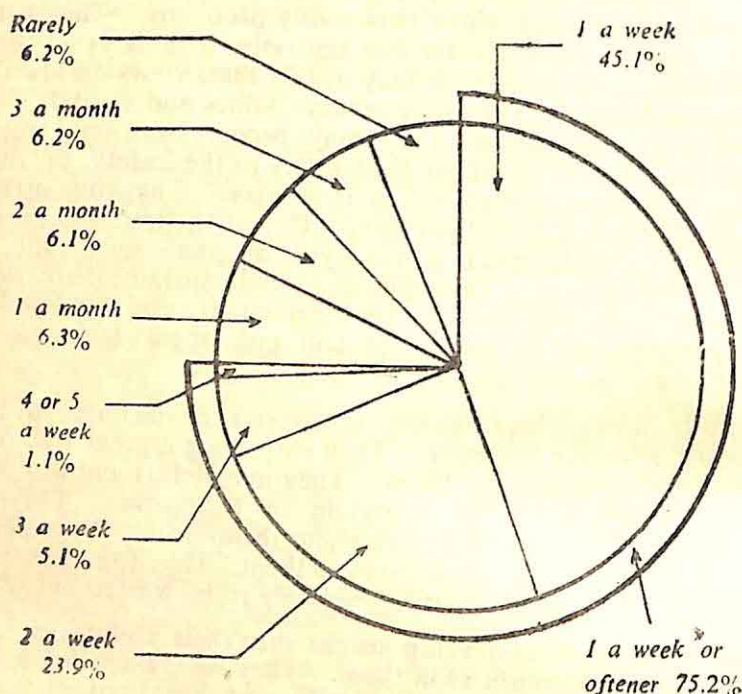


FIGURE 1

A great many investigations have been made within recent years on the problem of the movie attendance of children and youth. These researches have been invaluable in bringing to light the part played by this amusement in the life of modern youth. The figure given above clearly indicates the frequency with which high school boys attend movies.

Adolescents are generally restless and may easily get dissatisfied with the environment in which they have lived for a long time. If they do not find work and activities of their interest and choice, they may easily get bored and may react against the staleness of the environment. They may get feelings of apprehension, irritability, and anxiety. Conditions, which may give anxiety to them, may vary. Anxiety has been defined as a kind of uneasiness of mind or a kind of apprehension, irritability, or distress arising out of disturbances within a person's inner mind. Anxiety may arise from sense of insecurity or it may arise out of threat from others. Conflicting pressures on them may also evoke anxiety. Conflicting

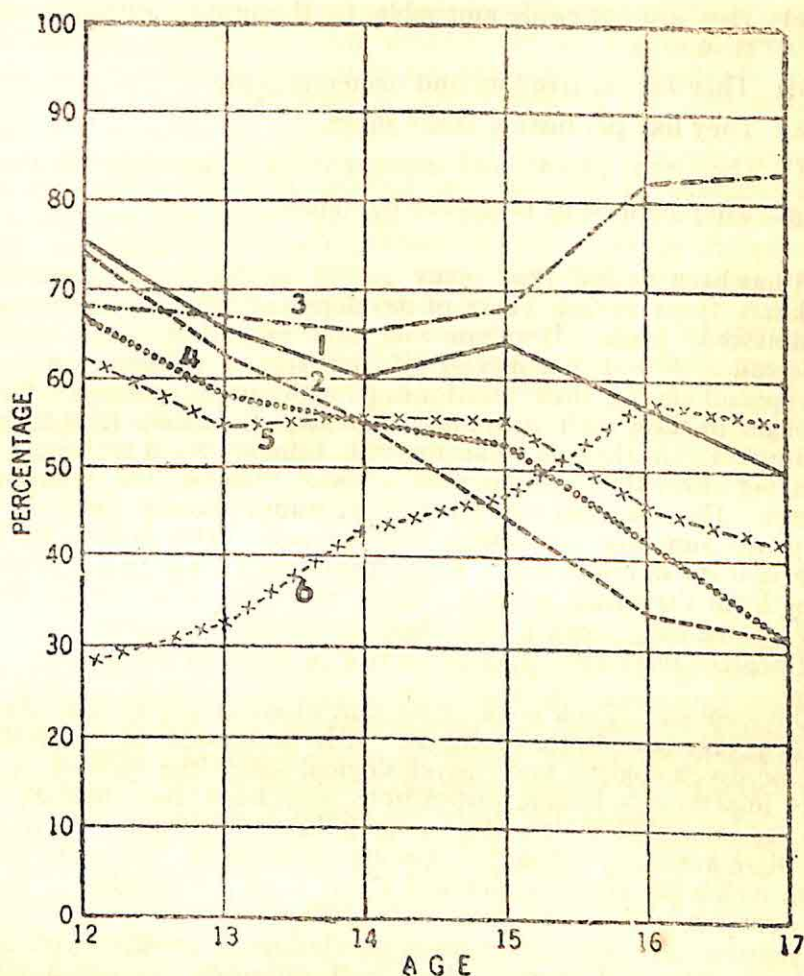


FIGURE 2

Changes of interest with age among adolescent boys: 1. Marching in a parade, 2. Cowboy movies, 3. Riding upon auto, 4. Making model airplanes, 5. Detective stories, and 6. Arguments.

pressures always prevail in culture. Adolescents have also to face pressures from within. There are other powerful forces which can make individuals feel unhappy or distressful.

Some of the psychological characteristics which are markedly found in adolescents are:

- They are keenly aware of the problems of morality.
- They are ambitious.

- (c) They are not easily amenable to discipline, authority and strictures.
- (d) They favour freedom and democratic life.
- (e) They like permissive atmosphere.
- (f) They want parents and teachers to be lenient towards them.
- (g) They tend to be rebellious by nature.

It has been found that many habits, attitudes, strength and weakness from earlier years of development may be carried forth to adolescent stage. Developments that may take place during adolescence is not exclusively of that stage. Adolescents try to take special care of their relationship with other persons. They are eager to show such attitudes of trust, suspicion, friendliness, hostility, etc., in their relationship with others. Such tendencies in them can affect their development in social, mental and emotional spheres. Development of positive attitudes among them is an important function of homes and schools. This process is very important for development. Adolescents must learn to utilise their strength for their own growth. They must learn to utilise their growing mental strength for their manifold development. They must protect themselves against narrow interests or prejudices.

Development of self is an important phase of adolescence stage. Self is a very complicated concept. It is composed of, according to some psychologists, many psychological states like feelings, attitudes, impressions, habits, dispositions and likes and dislikes. It refers to the image which adolescents hold about them. With the self, there are many attitudes. Among the attitudes, there are those things which are mostly concerned about them. Attitudes of right and wrong may also become part of this psychological self. Self may involve, after certain stages of psychological growth, concepts like I, we, mine and yours. About self, questions like worth, right and wrong, justice, etc., may become very predominant. The interaction of various attitudes in adolescence finally shapes their personality in a big way. The growing adolescents' ability and the concept of self is influenced by the way in which they accept others. If they are liked by others, they would like others. If they are hated by others, they will dislike others. Closely associated with the problem of self is the quest for meaning and purpose which constantly keeps adolescents thinking. This is so because they are constantly in search of selfhood. Adolescents are eager to see, to touch, to hear, to reason, to seek, to know, and to comprehend. These mental processes are essentially associated with the process of maturation. Adolescents want to discover and seek. They are too eager to frame and investigate the purpose and goal of life. Their investigation regarding self may be hasty, emotional and random. But they are motivated by their curiosity and they want to establish conquest of selfhood through their own means.

Similarly, search for values becomes their other quest. This quest for values goes on for ever. Adolescents are too eager to organise their lives. For this, they want to get sanctions from others and from the authority. They want to impart value to life. The search for values is inherent in the business for living. Values may also prove to be false or harmful as in the scheme of human values, norms are relative and relationships are temporary. Adolescents live on purpose, hope and strivings. They want to see meaning within the context of their own life and reality. Adolescent phase is also marked by feelings in young boys and girls to trust and believe others. They like situations to be rational. Trust is a very important basis for life. Life becomes meaningful when an attitude of trust and confidence prevails in the relationship among people. Trust and confidence beget trust and confidence. Those, who trust and confide in others, learn to love and like others. Trust will also develop mutual loyalties and a strong potential drive for belonging to others. It will result in a cooperative and trustworthy behaviour.

Factors Affecting Adolescent's Growth

Physical and psychological growth in adolescents are influenced by many factors. Relative influence of various factors in development of physical and psychological attributes of adolescents can be different. It depends on the need system of adolescence stage of boys and girls. In the scheme of human values, the needs and values vary from person to person and from society to society. It is also because life is conditioned by values of culture. Cultural norms vary from person to person and from society to society. However, there are certain common factors which tend to affect the growth and development in adolescence in a number of ways.

One of the important factors that affects the growth of adolescents physically and psychologically are parents. Parents are very important factors in the growth of adolescents. The quality of behaviour that a mother or a father shows towards children is important for their creative upbringing. Affectionate and loving parents inculcate an emotional feeling of goodness in their children. Children, under such conditions, learn to be free, frank, honest, and candid. Such children learn to be spontaneous in their behaviour. In the relationship with others, they are cordial and social. They show sympathy and happiness and are loving by nature.

But, if the parents are cold, ruthless and aggressive, the development of adolescents is very much affected. Both physical and psychological developments in children are affected if parents withdraw their affection, love and sympathy towards them. The trend in psychological development is badly influenced. Emotional tensions are bound to produce sadness and self-pity in adolescents. Normal discharge of emotional tensions are blocked by parents who

tend to be dominating and ruthless towards children. Repressed emotions will find their way in other channels which may assume the form of hysterical symptoms and delinquency in extreme cases. Parents, who are indifferent to their children, will produce mal-adjustment among their sons and daughters.

Another important psychological feeling during adolescence is the existence of anxiety. There can be many causes for it. Adolescents seem to get upset by little things. They are disturbed by trivial events. Little unfriendliness or disapproval will disturb them. Anxiety in adolescents is attributed by Jersild to three factors:

- (i) Stresses and uncertainties tied to human existence that affect the lives of all people.
- (ii) Conditions linked to the adolescent period of development, and
- (iii) Difficulties associated with unresolved problems and conflicts in the adolescent's life, extending back into early childhood. The aforesaid factors play their respective role in generating anxiety among adolescents.

Other factors, enumerated by other psychologists from time to time regarding the cause of anxiety, are :

- (a) Developmental predicaments among adolescents which are due to fast and quick growth in physical and mental aspects of the body.
- (b) Problems of identification. Adolescent tries to show increased identification with heroes and others. Such tendencies may take healthy and unhealthy forms.
- (c) Increased enthusiasm for Realism.

The aforesaid tendencies produce various types of reactions and feelings in them and they get transformed into varied emotional experiences. Such expressions like sorrow, anger, fear, pride, hope and despair may manifest in them in the wake of their effort to respond to the realities of world situation.

The quality of home in which adolescents live may also affect their development. This development can have physical, emotional, psychological and moral aspects. Many studies have been undertaken to find the relationship of social and economic forces on the development of attitudes, morals, habits, perceptions and personality traits in adolescents. It is reported that adolescents, belonging to lower socio-economic levels, tend to judge the behaviour and performance of others in their practical terms. Social and psychological dimensions may be at variance sometimes and they may defy

the physical and cultural circumstances of life. Good and bad conditions at home precipitate various psychological differences among adolescents. They may also determine character-building in them.

Environment influences attitudes and perceptions in adolescents. Attitudes may show positive or negative trends towards various problems of life. Adolescents are prone to acquire a stronger feeling of belongingness to social groups and less towards others. They will show different degrees of kinship with people in society. They will feel more in harmony with those things, events and persons whom they regard as their own. If there is a distance between objects and adolescents, prejudices are bound to come up. Prejudice is a negative attitude towards an object or a thing which generally disturbs the evaluation of things or events. Such reactions may develop hostility, distaste, dislike or fear among adolescents.

Social relationship of adolescents with people at home and outside house are important for them. This is a significant psychological task for them and forms an essential phase of their development. Adolescents have to learn to gradually wean themselves away from parents and parental-surrogates. They have to learn to establish separate 'selves' so that they achieve independence and integrity of their own. They have, in a real sense, to learn to leave the sheltered existence provided at home and to explore the life of their own meaning and satisfaction. In a way, adolescents tend to show their eagerness for the growth of self as well as for their emotional growth.

Moral and cultural atmosphere at home also tends to influence the psychological development of adolescents in a major way. Moral development is a sensitive development in adolescents. The quality of environment in which adolescents live will shape the mental and moral qualities in them. It is not easy for anyone to ignore this development. They may feel stresses in developing this aspect of personality in them. The type and quality of moral development in them will depend on the quality and type of influence in which they live from the days of childhood onwards. Proper moral development is a mark of maturity in human beings.

Frustrations play an important role in the development of adolescents. Constant frustrations may develop maladjustment among them and build constant emotional tension. They may also affect several voluntary and sensory perceptions in them and may develop aggressive tendencies. However, it does not imply that adolescents need to be over-protected. Over-protection is no substitute for absence of frustration. Some degree of frustration is found to be healthy and congenial for growth. Over-protection has been found to be non-corrective. With a view to foster greater responsibility among adolescents and in order to enable them to face harsh realities of life squarely, some degree of frustration and rubbing is

essential. Such a situation will enable them to be realistic in their appraisal regarding the problems of life.

Care and affection towards adolescents by their parents should not be used by them as a means for imposing their views upon them. Domination may curb individuality in adolescents. If parents and adolescents are openly rejecting or dominating towards adolescents, attitudes of adolescents can become strict and severe. Adolescents may develop a feeling of justification for rebelling against the authority. They may fight back against such reactions. Sole motive of care and attention has to be to allow adolescents to grow according to their own genius.

Since adolescence is a long period of dependence the problem and process of weaning becomes important for the survival of adolescents to get themselves weaned away from the physical dependence on their parents. Weaning has a lot of psychological sense in it. It not only means freedom from the physical and emotional dependence on parents but it also implies to build up one's own sense of 'ego' and 'self' in them. However, the process of 'weaning' should not imply that adolescents are being rebellious or defiant. Weaning is a process of self-assertion through which adolescents seek to be adults. This process affects their conduct and influences their process of reasoning.

The degree to which sense of responsibility is inculcated in adolescents is also a factor that conditions growth and development process in them. Ability to bear responsibility is a sign of development and maturity. If adolescents are able to discharge their duties and obligations without guidance from elders, they are mature persons. For proper way to influence that growth in adolescents, suitable attitudes will have to be developed in them by all means. Various aspects of responsibility will have to be emphasised to them as a necessary education for developing proper motives.

Various types of emotional, physical and mental supports are necessary for adolescents to save them from insecurities. Insecurities generate lot of worries and anxieties. Anxiety may affect normal functioning of the nervous system. Adolescents have to maintain proper homeostasis in their system. Insecurity may develop certain ambitions and repressions. It may promote repressive feelings and may add hostility to their behaviour. Parents and others have to be realistic in their relationship with their adolescent wards. Since adolescents are going ahead to be adults soon, they want to enjoy the privileges of adults as well. Various types of supports will develop various likes and dislikes in them. Quality of environment, in which adolescents live, determine perception and feelings to a large extent. Any distortion in the environment is also likely to develop distortion in their attitudes. Attitudes of respect and defence in them can be fostered as a by-product of that environment. They may have difficulty in their relationship with others if

the environment is hostile to them. They may revolt against the authority figure. Better exchange of ideas and feelings may give them better perception about the environment. The quality of better feeling and interest in them may also be a by-product of the influences that the environment is exerting on them.

Religious atmosphere, in which adolescents live, can also affect the mental and attitudinal development in them. Their convictions and attitudes can be different if they live in secular atmosphere when compared to an environment when it is not secular. Adolescents' total personality and their upbringing can be significantly changed if they receive religious orientation during adolescent years. It has been seen by various workers that adolescents profess various kinds of religious faiths. If homes and schools are religious in orientation, religious concepts are deeply fused in them. It becomes a part of moral training. In an environment, where the secular forces are at play, attitudes of adolescents towards religious faith can be differently determined. Environment can intermingle in adolescents' minds in many complicated ways. It is evident that religious life emphasises certain values and norms and they also profess beliefs, attitudes and practices which generally centre round religious practices. Due to participation in various systems of practices and professed convictions adolescents determine their relation with others. It may be purely a subjective experience or it may involve a social or mystic relationship. For attaining a faith which religion seeks to foster, adolescents will have to work earnestly in this direction. Religion may involve various ceremonies and practices. It may also involve a personal realisation. Adolescent years are very congenial for the development of this type of faith. Since religious functions are organised in a regimental way, its practices can go a long way in establishing feelings, attitudes and sentiments towards life in general. These experiences produce deep sense of involvement. However, in spite of regular practice of religious faith, adolescents may develop a more profound view of religion. Foundations of faith have to be grown deep and properly. Upbringing has to be done properly and in a regular manner.

The philosophy of life of parents, teachers and friends may or may not affect the way of life of adolescents. The period of adolescence is a period of questioning. It is a period of rationality and self-examination. Integrity and moral codes will be built up by adolescents on the matrix of their own analysis and thinking. Adolescents tend to be deeply rational and logical. They want to be scientific in their analysis of problems of the world. They may not readily agree with the dogmatic faith and crude superstitions of culture. They want to follow an enlightened approach to life in a major way. Psychological development in adolescents is a very difficult task and every one has to help in its proper growth.

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SEX EDUCATION

Importance

SEX IS a universally strong biological drive in the life of human beings. It plays an important role in preservation and building of human society. Since sex drive has powerful potentiality to influence human life it is important to harness this energy for the harmony and development of human personality. Much attention has been given to this drive by societies since the dawn of human civilisation. It has considerable influence on the human mind and sex needs, being more often frustrated than any of the other human needs, sex frustration is bound to affect development of human personality to a great extent.

The importance of sex in the development of human personality has been emphasised by psychologists who profess psychoanalysis. They have tried to conceive a picture of the inner life of man in terms of sex energy which is a significant source of action of human beings. The dynamic interplay of inner life of a person, his behaviour, expressions and experiences are attributed to this source of energy. Maladjustment in life and psychopathology in human behaviour is attributed to unsatisfactory behaviour of sex life. Sex is supposed to provide certain influences that stress certain factors in human life. Normal and pathological behaviour is thus related to sex behaviour. Some have attributed marginal processes of powers to sex force.

Man's sexual activity in an urban society has been more and more reduced to certain vicissitudes. Attendant problem of learning how to be natural in this activity needs the help and organisation of sex education. Sex education should aim at developing proper attitudes and proper level of understanding on the sex activity among boys and girls in the juvenile age so that misconceptions and wrong notions may not mar the healthy understanding of sex as force in human life. Healthy and objective information on

sex will not only help in ensuring better adjustments that are often marred by sexual frustration but will also help in securing satisfactory relationship among people when they get married. Experts have considerably emphasised the need for sex education among juveniles so that misinformation may not lead them to commit wrong actions which is likely to lead them to tragic goals of life. Therefore, we have to provide certain basic information on sex behaviour in human beings, the knowledge of which will enable boys and girls to understand the behaviour in proper scientific perspective.

Physiology of Sex Behaviour

Sexual behaviour and its physiological aspects in human beings have been watched in past by observing the behaviour of animals. Sex behaviour in animals is simple to observe. It is not very much complicated by learning, experience, and ideas.

In the case of human beings, it can be modified a lot by experience, learning, etc. Sexual life is a psychological basis. It is demonstrated by the fact that sexual desires are felt to undergo waxes and wanes. There are life-cycles in both animals and human beings. Sexual desires are felt in human beings at the stage of puberty. The menstrual cycle in women is an "estrus" cycle. However, sexual desire in women is not completely controlled by the events of this cycle. In every normal individual, there is a single long period of mating activity, beginning with the maturation of the gonads at puberty. After puberty, the period of sexual activity is continued until it ends in the relatively sudden menopause of women or the rather gradual sexual senility of men.

Physiological events have been worked out in considerable detail during estrus cycles. Under the influence of the follicle-stimulating hormone (FSH) of the anterior pituitary gland, the follicles of the ovaries begin to develop. As the immature follicle grows it secretes estrogen, and this, in turn, helps the anterior pituitary body to reproduce a second hormone, the luteinizing hormone (LH). The combined influence of FSH and LH helps the follicle develop and thus more estrogen is secreted. Next, large amounts of estrogen change the epithelium of the uterus and vagina and at the same time influences the pituitary gland to secrete more LH and less FSH. At this point in the cycle the follicle begins a new stage of development and under the influence of LH, becomes the corpus luteum. As the corpus luteum develops it continues to secrete estrogen and in addition, elaborates a new hormone, often called progesterone which causes more epithelial changes in the uterus until it is ready for the ovum to be implanted if fertilisation takes

1. Morgon, C.T. and Steller, E., *Physiological Psychology*, Chapter XX, pp. 422-23. McGraw-Hill Book Company, Inc., London, 1950.

place. Progesterone also serves to stimulate production of the lactogenic hormone of the anterior pituitary, prolactin. Prolactin, finally, is important in the development of the mammary gland for milk production, should pregnancy occur.

Physiologically, 'estrus' or phase of 'heat' are cyclic and in the case of animals they are seasonal. Birds mate in the spring, dogs in the spring and fall. In terms of bodily cycle, female mammals experience an estrus cycle. During the major part of the cycle, the female is unreceptive to the male. The menstrual cycle in woman is an estrus cycle. However, it is evident that existence or appearance of sexual desire in woman is not completely controlled by the events of this cycle. From various experiments carried out in human beings and animals on sex behaviour and sex needs are conditioned by presence in the blood of certain hormones. These hormones are secreted by internal endocrine glands. Regarding the role of the hormones in influencing sex behaviour, Boring states the following :²

"There is strong evidence that mating in animals depends only secondarily on the perception of a mate. Being aware of the presence of a mate does not stimulate sexual desires unless the necessary hormones are present in the blood. Nor is any particular set of sensations requisite. Surely, sight and touch may act together, or one sense may act alone when the animal is deprived of others. In this respect, sexual desire is like thirst or hunger. Water is tantalising only when the animal or man is already thirsty, food only when he is already hungry. If he is thirsty or hungry and sees no food, then he gets restless, becomes more active than usual."

Sex desire and behaviour are determined by many factors in human beings. Reaction to sex behaviour tends to depend upon learning of responses. In this learning, emotions, thoughts, the sex behaviour in previous experiences and ideas considerably influence human beings. Boring reports further that "habits of thought and action are supposed in both men and women upon the activities of their hormones, that, having learned to want sexual relations, they continue to want them even when the power of procreation is missing."³ It states that sex behaviour can be modified through sex education. If education is rational, sex attitudes are developed on healthy lines, if they are distorted sex behaviour can lead to certain aberrations and abnormality. Accordingly, hormones alone do not influence sex behaviour. Habits, thoughts and action also determine the quality of sex behaviour in human beings.

2. Boring, Edwin. G., *Psychology for the Armed Services*, p. 391, Natraj Publishers, Dehradun, India.
3. *ibid.*

Thus boys and girls can be trained in proper habits, thoughts and action. Physiology provides certain bases for sex behaviour. It is modified by experiences and learning available in the environment.

Psychological factors, besides physiological conditions, influence the activities of human beings including their sex behaviour. Notwithstanding the fact that in old age, when androgens diminish, many aged people are energetic and active. Their vigour and force in their behaviour can be attributed to healthy habits of activity, and to their strong motives and goals. Ideational habits sustain human beings when their bodily vigour has considerably diminished. Role of idealism and sentiments are always emphasised in society and in the growth of healthy personality of human beings.

Boring asserts that there "seems to be no question that androgens in a man increase his energy and efficiency, have thus an effect upon his usefulness and effectiveness in living." It would be wrong to emphasise, therefore, the basis of sex on physiological grounds alone. Habits and ambition also play some significant role. It cannot, however, be concluded that physiological bases of sex behaviour has to be minimised. It has been observed that castration vitally affects the body, impairs intellectual nerve and the power of creative thinking.

From the foregoing paragraphs, it is evident that physiology plays an important role in determining sex behaviour. But physiological basis do not exclusively condition sex behaviour. Many non-physiological aspects also affect sex activities in human beings. Learning, experiences, conditions in society and cultural norms considerably influence sex activities among human beings. Mating activities among human beings take place under sophisticated conditions and in certain parts of the world it has become highly organised and highly conditioned by time-old norms and cultural demands of society.

There are many wrong conceptions among boys and girls on physiological understanding of male and female reproductive systems. It would be highly appropriate to give accurate and correct information to them on the human reproductive systems.

Hormones and Sex Behaviour

Gonadal hormones have been produced by biochemists and injected into human systems. In castrated male guinea pigs, for example, sexual behaviour returns after treatment with testosterone. However, injection of hormones may not restore sexual potency in

all castrated men. Castration sometimes may destroy sexual potency and sometimes not. It is apparent that psychological and other factors are important enough in men to obscure the effects of castration, and replacement therapy.

Egrogen influences sex behaviour. In castrated female rats, the injection of estrogen brings about estrus and receptivity. There is definite relationship between the amount of hormone injected and the degree of sexual responsiveness induced. Many positive effects of hormone treatment are reported. There have been some failures also.

Use of gonadotropins or gonadal hormones to immature animals, both male and female, makes them sexually arrive at an early age. Pituitary extracts also provoke sex activity.

Regarding the relation between hormones and sex behaviour, Morgan⁴ reports the following findings:

1. In both male and female castrates, androgen brings out masculine sexual behaviour and estrogen feminine behaviour;
2. Androgen can bring out feminine behaviour and estrogen masculine behaviour in animals of both sexes; and
3. Male hormones given to males and female hormones given to females may inhibit the development of normal mating behaviour if they are administered in larger doses to animals castrated in early life.

Effect of pituitary gland on sex behaviour is also noticed. Removal of these glands lead to the genital glands showing a tendency to fatty denegation. Removal of the gland from female dogs during pregnancy causes abortion. Removal of glands also result in persistent sexual infantilism with failure of functional activity in sperm production in the testis.

Pineal gland also influences sex behaviour. The pineal is a small gland near the base of the brain. It is in contact with the roof of the third ventricle from which it develops embryologically. Tumorous growths on or near the pineal glands are associated in children, with the premature development of sex, precocious mentality, and an acceleration of growth of functions instead of at the normal time of puberty. Horrax reports the removal of the pineal gland furnishes some internal secretion which checks growth and especially checks sexual maturity. Extrats of the pineal body when

4. Morgan, C.T., and Stellar, E., *Physiological Psychology*, pp. 429-30, McGraw-Hill Book Company, Inc., London, 1950.

may not lead to homosexual intercourse when this outcome is permissible and objectively possible. One of the forms of sexual maladjustment occurs when deviants prefer sex relations with persons of the same sex when there is an opportunity to get it gratified with the help of opposite sex who is easily available.

Those, whose sexual development is not normal, may find gratification of sex by indulging in activities like exhibiting sexual parts or looking at them. Some may get sexually excited by intimate things like shoes etc., other forms of sex deviations are displayed in behaviour like sadism or massochist suffering.

All civilisations have condemned sexual deviations as immoral and unnatural. Laws have been passed in various societies to make sexual deviation punishable by law. Attitudes of public have been constantly roused by societies to condemn sexual deviations.

Freud, the founder of psychoanalysis, has described sexual deviation or perversion as a behaviour in which a person acts out of conflicts and fantasies without suffering from anxiety. Psychosexual deviations are comparable to psychopathic desire loss.

Anxiety in a person towards sex life may lead to sex disorders. An arrested or distorted sexual pattern may result due to childhood anxiety which forces a child to select an abnormal object for sex love.

There are various types of sexual deviations which result from faulty concepts about sex from which the person may suffer. The common deviations are :

- (i) Overt homosexuality
- (ii) Genital exhibitionism
- (iii) Sexual looking or voyeurism
- (iv) Fetishism
- (v) Transvestism
- (vi) Sadomasochism.

1. Overt Homosexuality

Homosexuality is regarded as a commonly prevalent maladjustment. Technically, in overt homosexuality, the person prefers sex relations with his or her own sex in spite of the availability of potential partners of the opposite sex. In case of certain overt homosexual adults, they are normal males or females both having adequate genital development and as to secondary sex characteristics.

In early years, it was assumed that heredity was a decisive factor in homosexual behaviour. Freud attributed this deviation to

archaic mechanisms. Sometimes, stress is placed upon pre-edipal phases of development and upon edipal conflicts.

Homosexuality may be also due to inborn constitutional factors and such individuals are rarely interested in members of the opposite sex. In some cases, homosexuality may be based on early childhood seduction by an adult homosexual or previous frustration in love relations with opposite sex.

Strong homosexual attitudes may get established in the nervous system in the process of maturing and this habit may become unalterable. Social pressures and will power may be too feeble to undo such strong habits and attitudes.

2. Genital Exhibitionism

Exhibition of genitals becomes one of the sources of sex gratification with some people. It is generally confined to men. It is usually a post-pubertal and post-marital phenomenon. The person, suffering from this maladjustment compulsorily shows his genital to young women or mature women in public places, streets, parks etc. It is said that he does this to stimulate women to do the same. There is some basic unconscious motivation behind this behaviour. People with such behaviour may be sexually inhibited and timid. From a psychoanalytical point of view, castration anxiety and narcissism are often quoted as factors responsible for this behaviour.

3. Voyeurism

Voyeurism is a sexual deviation in which a person tries to get sexual gratification through looking at the sexual organs, or naked body, or the sexual activities of others. Male voyeurs are generally inhibited sexually. They are heterosexual as regards their object. Common behaviour patterns of voyeur are peeping at women who are undressed or undressing.

Psychodynamics behind voyeurism may be the same as those behind exhibitionism. The voyeur, like the exhibitionist, remains fixed at an infantile level.

4. Fetishism

In fetishism, a person tries to sex satisfaction of gratification by fixation on an object. He selects an inanimate object as the source of love. The commonest fetish is a women's shoe. Fetishism may be predominantly a sexual. Normal fetish behaviour seems to provide security to the person. There is a hypothesis that the fetish is a substitute for a sex partner, a substitute that makes no demand and is not itself dangerous. Hair fetishism is an interest in the hair of the Mons veneris, part of the external female genital, an interest in denying the absence of male genitalia in women.

5. Transvestism

It means literally cross-dressing. A person suffering from this deviation tries to obtain sex gratification with the opposite sex in a symbolised way by putting on the clothes of the opposite sex. This behaviour is largely confined to males. Women who dress like men are usually homosexually inclined. Stekel supports the view that transvestism is a homosexual behaviour. A minority of male transvestists are also fetishist who can achieve full potency only while they wear some item of women's clothing. Psychoanalytic thinking emphasises castration anxiety as responsible for this sex deviation.

6. Sadomasochism

By sadism is meant that the person tries to get sexual pleasure in inflicting pain, restriction or humiliation on others. By masochism is meant to get sexual pleasure by exposing oneself to suffering. It is generally considered that sadism is due to fixation in an infantile misinterpretation and distortion of the male role in sex intercourse which the adult as a child misinterprets as a brutal attack. Masochism is looked upon as fixation in an infantile misinterpretation of distortion of the female role. Both sadism and masochism are traditionally interpreted as defences against castration anxiety.

Masturbation as Sex Deviation

It is a form of sex behaviour in which most boys, when the sex tensions are strong, learn to relieve themselves by masturbation. Some men and women may continue this behaviour when sources of satisfaction are otherwise available. Continuance of this behaviour may give rise to psychological difficulties and may raise the problem of conscience. In some extreme situations when normal outlet for sex gratification is not available, small practice of masturbation in moderation, accompanied with day-dreaming, may form physically as a harmless mode of relief. But for most human beings, there are psychological difficulties inherent in this practice. It may arouse certain emotional feelings which may interfere with the efficient working. Masturbation is not rare. It is practiced by boys and girls, men and women at one stage of life or the other. Its practice does not lead to feeble mindedness or impotence as is generally believed. But, as a practice, it is bad and has to be guarded against as far as possible.

Impotence and Its Causes

Lack of getting erection in genital organ of male is called impotence. Mechanism of erection are psychological in nature. There can be both psychological and physiological causes of impotence.

Physiologically, if erection centres in genital parts of the body

are injured, they may ruin erection nerves and may lead to impotence. Erection centre can be injured by either destroying or damaging cells and nerves responsible for gaining erection or by blocking urine passage by urine or seminal discharge by sealing the mouth of penis through certain mechanical or manual means. By blocking the outlet, the pressure of water of seminal fluid inside genital organ will apply corresponding pressure on other sensitive duct and nerve passages which may then cause rupture in veins responsible for erection process. Leslie Brained Arey⁶ warns not to block the passage within the penis by applying force and its mouth as it would damage and rupture nerves inside genital system and may cause impotence. He has discussed the function of erection centres in genital organ in detail.

Impotence can be caused by psychological factors also. Some shock or traumatic experience may lead to psychic transformation, followed by impotence. Since impotence caused by psychological reasons is a vast subject to master, it is suggested to read a standard textbook on abnormal and clinical psychology on the subject.

Impotence, premature and retarded ejaculation are the commonest forms of sexual maladjustment in the male. Frigidity may be present in women. Anxiety, fear and guilt may interfere with masculine sex functions. Emotional ambivalence towards women or a feminine identification may lead to causes of impotence. There may be conscious as well as unconscious factors in producing guilt or anxiety. Sometimes, a strict super ego makes sexual activity seem sinful, dangerous, and even unthinkable. There may be pathological guilt feeling about sex. Aggression aroused by anger sometimes leads to effective male malfunctioning. Unresolved edipal fears of a father figure may sometimes result in an irrational inability to fulfil the male role adequately for adulthood.

Sexual malfunctioning in female may give her such problems like frigidity, menstrual difficulties, and pathological reactions to pregnancy. It may also lead to problems of breastfeeding. Female psychosexual disorders have to be looked into properly for adequate treatment.

Sublimation of Sex Energy

Conversion of sex energy into constructive forms and socially approved ways is known as sublimation process. In sublimation, sexual desire is drained into the creative achievement or into wholesome direction. Any goal, pursued with enthusiasm has a sublimative effect upon sexual frustration. A person, sexually frustrated, may, throw himself into his work with full devotion and in this work he may seek emotional satisfaction of his needs. Sublimation may not provide a perfect adjustment as people may seem to lose

6. Arey, L.B., *Human Histology: The Male Reproductive System*, pp. 264-278.

themselves in the intense and emotional pursuit of other goals, accomplishing a reasonable, if imperfect, adjustment of their emotional lives.

Transfer or sublimation provides partially perfect substitute for the usual sexual life of a person, man or woman, during the normal reproductive period. In case of sexual frustration, the basic difficulty is to divert sex needs into constructive and socially approved channels. This can be done by sublimation which will consume the psychic energy and can be converted into constructive ways. This can be developed and fostered only at the juvenile stage. All the above concepts it is presumed may be brought to the notice of juveniles and incorporated in regular class-room teaching. The advantages far outweigh the disadvantages.

Sex Adjustment

In our present society the child is likely to receive information from other children about his body structure and functions earlier than many parents suspect. It is, therefore, important that each child receive, before he is stimulated by misinformation, an understanding of the process of birth, of the parts and functions of his body, and of his maturing relations with their same and the opposite sex.

The establishment by the young infant of desirable health habits of elimination, cleanliness of body, and the prevention of body manipulation are forms of indirect sex education. Children are curious and tend to become unduly interested in matters which their elders appear to want to keep from them. Hence a young child should become accustomed to seeing, as a matter of course, the naked bodies of other children of both sexes. Structural differences between the male and the female should be observed by him and accepted so that later, curiosity concerning sex differences may be lessened.⁷

He is entitled to know where babies come from and that sister is different from brother in some respects. He should be taught the correct names of body parts, such as navel, rectum, buttocks, anus, penis, testicles, and vagina. The child should know that a new baby is formed in its mother's body. He should know also the father's part in the creation of the new life. Information of this kind, however, should be given gradually, objectively and tactfully, and fitted to the child's maturing power to understand it and to appreciate its significance to himself and his own behaviour.

As the child nears puberty he needs to be prepared for the changes that will take place within him. New sex urges may cause him to want to experiment with his own body or with other boys' and girls'. The effect upon adolescents of the beginnings of adult

7. Lester Grow, D. and Alice Crow., *Educational Psychology*, American Book Company, pp. 566-69.

sex life depends in great part upon the amount and kind of preparation that has been given them by their elders. To the erroneously informed or the non-informed young person, these changes may be accompanied by severe and often damaging shock. Although a boy usually does not experience the same emotional disturbance at the approach of puberty that may come to a girl who is unprepared for her first menstruation, he may develop feelings of anxiety as the result of the physiological changes of seminal emissions. Healthful, objective information concerning the probable appearance of these phenomena at puberty will do much to counteract the conflicts that may arise in the adolescent boy.

If he has received wise sex education in his pre-adolescent days, is given ample opportunity for association with members of the opposite sex, and is not exposed to distorted sex attitudes on the part of his elders, he will be able to make satisfactory adjustments to his developing sexual urges.

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MENTAL HYGIENE : ITS NATURE AND SCOPE

Importance and Types

MENTAL hygiene is concerned with realisation and maintenance of the mind's health and efficiency or in other words it deals with healthfulness of mind. Some psychologists¹ have defined mental hygiene as 'Mental Health'. This does not mean that health of body be ignored. On the contrary, the physical basis of mental health are of fundamental concern of mental hygiene. In simple words, mental hygiene is concerned with the study of factors which go against mental health and efficiency. Mental hygiene is not exclusively a purely medical subject. It goes beyond the confines of hospital and invades the precincts of the home, the school, the factory and other institutions which influence human conduct. According to *Dictionary of Education*, mental hygiene means "establishment of environmental conditions, emotional attitudes and habits of thinking that will resist an onset of personality maladjustments. It is the study of principles and practices in the promotion of mental health and the prevention of mental disorders."

Mental hygiene means the balanced and integrated development of personality. "It is a science that deals with human welfare and pervades all fields of human relationships."² The aim of mental hygiene is to "aid people to achieve more satisfying and more productive lives, through the preventive of anxieties and maladjustments."³ As a matter of fact, it is that growing body of knowledge and technique drawn from sciences of psychology, child study, sociology, psychiatry, medicine and biology, which has for its purpose, firstly, the understanding and evaluation of human personality, the promotion of mental health as an expression of optimal adjustment to one's self and the world resulting in the highest integration,

1. Pintner Ryan, R., West, J.J., Crow, P.W. Smith, L.D.S., *Educational Psychology*, 5th Ed. Barnes & Noble, Inc., New York, 1956, p. 151.
2. Boring, E.G., and others. *Foundation of Psychology*, p. 542.
3. *ibid.*

and secondly, the personality maladjustments by suitable treatment. A mentally healthy person is one who has a wholesome and balanced personality free from schisms and inconsistencies, emotional and nervous tensions, discards and conflicts.⁴ Wallace-Wallin has defined mental hygiene as "the application of a body of hygienic information and technique called from sciences of psychology, child study, education, sociology, psychiatry, medicine and biology for the purpose of observation and improvement of mental health of the individuals and of the community; (ii) for the prevention and care of minor and major mental diseases and defects and of mental, educational and social maladjustments."⁵ According to dictionary mental hygiene is the science or art of maintaining mental health and preventing the development of maladjustment and neurosis.

In the early 20th century there became apparent a commendable interest in the problems of mental health. This attitude encouraged the application of scientific knowledge to the therapeutic treatment of inmates of the hostels for the mentally ill. Prof W. Beers is called the father of the mental hygiene. Once, when he was suffering from some ailments, he realised that various ailments are caused due to failure of the individual to adjust himself with situations and requirements of environment. This maladjustment also leads to the development of various mental ailment. It is necessary to do away with them. With this aim in view an International Mental Health Society was established in 1908. The society believed in the slogan 'sound mind resides in sound body.'⁶

Mental hygiene and education are not contradictory but are complementary. The common aim of mental hygiene and education is adjustment. It is a triumph of mental hygiene that education is coming to be looked upon more and more from the point of view of the development of the personality of the child. Few years ago it would have surprised people to know that a child had personality. Today guarding of this personality is the most precious right.⁷

There are two spheres of mental hygiene : Prophylactic Hygiene and Meliorative Hygiene. Prophylactic side of hygiene is oriented towards the prevention of disease, breakdown, weakness, disaster and death. The meliorative side of hygiene is oriented towards the acquisition of better health, more energy and abundant life. It stresses the normal and the ideal as opposed to the abnormal and pathological. It is obvious, therefore, that mental hygiene is by no means restricted to the job of safeguarding people from actual mental disease. Its more positive task is that of the meliorative

4. Burnham, W.H., *The Wholesome Personality*, p. 77.

5. Wallace-Wallin, *A Test Book of Mental Hygiene*. Hountrias, p. 8.

6. Whitehouse Conference on Child Health and Protection, p. 58.

7. Hamley, H.R., *The Balanced Personality*, The New Era, April 1936, p. 91.

branch of the subject, i.e., to render to worried, serene—the efficiency and better health. It is interested in making the bad good and good better. Nothing is said about making the better the best. Just as a competent architect can suggest how a given house might be made better even though he is unable to describe the ‘best house’, so the meliorative hygiene may indicate how the given personality might be improved and yet find himself non-plussed if asked to specify the character of an absolutely ideal personality. The most important function of mental hygiene is to build up a ‘moral’. Ultimately, the aim of mental hygiene is to promote ‘moral’.

Place of Mental Hygiene in Educational Practices

Mental hygiene has an important part to play in educational practices. With the knowledge of mental hygiene school has a great opportunity to develop normal social attitudes, training social skills and better adjustment. During the period of childhood, prevention of mental ill health can be effected with the knowledge of mental hygiene. School work can become wholesome and pleasant. Whole personality of the child can be adjusted to better social environment. The detailed description of the place of mental hygiene in educational practices is given by Pintner⁸ and others as reported below :

The Meaning of Normal and Abnormal

(a) *Normality is matter of degree*—It is an error to suppose that a clear line can always be drawn between the normal and the abnormal. No universally satisfactory definition of ‘normal’ has yet been formulated. If we knew what ‘normal’ meant, we would, of course, know what ‘abnormal’ means. The words have been used in various ways.

(b) *The normal at one's best*—One view of ‘normal’ is what a given person may be at his best. According to this definition, when a person is below his best, he is abnormal. Such a view indicates that normality is a matter of degree. It does not show, however, what one's best really is.

(c) *Statistical definition*—A second view of the normal person is statistical. According to this view, the normal person is the average person.

The Opportunity of the School

The school has a golden opportunity to train pupils in good habits of living. The work of prevention is most productive during the period of childhood. Good attitudes, habits of taking proper care of the body, skilful development of efficient and economical work habits and the like may be taught in school. The school has

8. Pintner, et al, *Educational Psychology*, Barnes & Noble, 5th Ed., p. 153.

a great opportunity to develop normal social attitudes, and training in social skills. The opportunities for preventive work in mental hygiene, under school conditions, are still largely unexplored, although many advances have been made within recent years.

Conditions of Mental Health

The nature of mental health is not yet fully understood. Much is known about conditions of health. Some of the physical conditions of mental well-being are care of body, cleanliness, care of eyes and other sense organs, dental care, proper food, fresh air, adequate lighting, and types of activity, or exercise, suited to the nature and need of the individual. The conditions of mental health are not fully understood, but a large number of very simple and useful rules may help us in the task of maintaining poise, serenity and self-control.

The Hygiene of Instruction

The hygiene of instruction is an attempt to make school work wholesome and pleasant. This does not mean 'soft pedagogy'. It does not mean sentimentalism. It means that the new aim is to develop the whole personality to train the child to adjust himself to his social environment in a creative and cooperative way; and to discover and develop the child's superior abilities. Integration of personality by means of normal activities is the great aim.

Habit

Customary types of acting tend to persist. Thus, we come to speak of the 'force' of habit. The aim of hygiene is to put this force of habit to work in our best interests. The important thing is to form habits in the right sequence. Every step in the right direction makes the next step in the right direction easier. We retain our plasticity, our self-mastery and our freedom, if the force of right habits is on our side. If the habits are bad, the step in the right direction is much harder to take than if the habits previously learned had prepared us for it. We are likely to be sidetracked into a blind alley by habits of an undesirable kind. Good habits increase our freedom, skill and mastery. They help us achieve our best, namely, our normal performance.

Individual Differences

Standardization has many good uses. To standardize often means to promote efficiency and economy. In the search for economy and efficiency in education care must be taken, however, to remember that people differ. The same methods cannot be used in the same way for everybody. To ignore the fact that people differ in ability, intelligence, early social training, physical ability, strength, as well as age and sex, would be a serious mistake. If

right it. Frequently, the trouble is fatigue. Wise alternation of work and rest periods, suited to the special needs of the individuals, is useful for avoiding plateaus. At times we become 'fed up', or bored. Our reason tells us that we ought to go on working; but we are blocked by our emotions. We go stale. The danger is that, when we are bored, our improvement may be arrested. Sometimes we make a rash decision and suspend effort altogether. When we are bored, we cannot give our best performance. Skilful change of activities, at the right time, is useful in avoiding the deadening effect of boredom. Complexity of the material is a third cause of the plateau. This factor probably does not mean that the material is too much for us : it is far more likely that we are not quite ready to deal with complex material successfully. The complexity of the material and the aim of *mental hygiene is to promote the self-understanding we need in order to see clearly our problems. The aim is to develop normal habits of work.* Plateaus in general may be due to faulty work habits. Here mental hygiene renders some of its most useful services in showing us how we may correct and constantly improve our methods of working and achieve greater mastery.

Recreation

One hundred years ago play was regarded by most people as a frivolous matter. Today our understanding of play has improved. With growth in understanding, our attitude toward play has changed. We have begun to find out a way "all work and no play makes Jack a dull boy." We have learned to appreciate the social significance of play. Cooperation, teamwork, and mutual understanding are important values to be derived from play. Play may also provide us with socially approved channels of energy discharge not provided by our work. Hobbies are useful. Artificial distinctions have sometimes been drawn between work and play. Work need not be disagreeable. Bad habits of work make work disagreeable. *Mental hygiene attempts to develop wholesome attitudes by means of play.* Play is more than a pedagogical device; it is nature's plan of growth and development. Children have the right to play and mental hygiene takes its cue from the way of nature

Fatigue

When we are fatigued, our performance suffers. Our spirits may be low. *Mental hygiene aims to teach the individual how to conserve his energy and strength.* To know when and how to rest is important. To rest before one is completely fatigued means quicker recovery. Mental hygiene tells us how to use our reserve strength wisely. Fatigue is largely controlled by controlling working conditions. Normal habits of rest and sleep are necessary. Sometimes people tire themselves out by worrying. To quarrel with oneself is another undesirable way of using one's energy. Mental hygiene attempts to help us build a pattern of living on the basis of intelligent insight into our own needs of mind and body.

Conservation of the Sensory Apparatus

Our senses keep us in touch with what is going on in the world about us. The senses of sight and hearing are especially important in normal education. The marvellous machinery we call the sensory apparatus is so efficient that we are likely to take it for granted. Only when the machine gets out of order that many of us appreciate its importance. *The aim of hygiene is to teach us how to take care of our senses. Hygiene trains us to refrain from abusing our senses.* Many people impair their efficiency and endanger their well-being by ignorant or careless abuse of the sensory apparatus. In the school, hygiene has rendered a useful service in conserving and training the senses. Eye and ear defects are discovered by hygiene and treated before they have threatened the health and happiness of the pupils. Defective eyesight and impaired hearing are often accompanied by undesirable mental attitudes. Frequently they are the roots of injurious inhibitions. Children with poor hearing are sometimes unfairly deprived of the opportunity to develop normal social attitudes: people mistakenly regard these children as stupid. Development may be arrested because a child cannot hear or see well. Conservation of the sensory apparatus means that children are to be taught to take wise care of their eyes and ears and other senses.

Teamwork and Group Adjustment

Groups can often do things better than individuals. The democratic idea is based on faith in wise group work. The leader today is he who integrates the superior abilities represented in the group. The rules and elements of superior teamwork can be taught in the school. The principle of integration may be applied to groups as well as to the individuals. *Mental hygiene aims to develop the child by providing opportunity for normal group activity under school conditions.* More and more this aim is appreciated as a major contribution on the part of hygiene.

Heredity

Since much remains to be learned about human heredity, extreme views are misleading. Some maintain that heredity, is everything. "Blood will tell" is their theory. People who hold this view are likely to make the mistake of thinking that training is of negligible importance. They believe that 'genius will out'. Even a genius, however, needs training. We are born, not with skills, but with capacities. Skills imply training. At the other extreme are those who believe that anybody can be taught anything. These are likely to become the blind worshippers of method. The holders of this view are likely to ignore the individual difference among children. A third view of heredity and environment suggests that we learn all we can about the capacities of children and adapt the wisest courses we know in the work of developing these capacities.

The important thing is to provide the child with suitable opportunities to grow and develop normally.

Sex Education

Sex education means more than mere instruction in matters concerning sex relations. It is an important part of training in the art of wholesome living. Much confusion exists at present in regard to the aims and methods of sex education. Mental hygiene has not yet solved the problem of sex education, but much useful work has already begun. Intelligent self-control, normal habits of work, skill in solving personal problems of mind and body, and so on, are included in sex education. The older methods sometimes made virtue odious. High personal standards of conduct may be taught in an intelligent and sympathetic way. Nowhere is the value of example more important than in sex education.

Seeking Worthwhile Goals

Unless our activity has a definite goal, we are likely to scatter our energies and waste our efforts in aimless wandering. A goal makes life a battle and a march. To have a goal is not enough : the goal must be such that it gives us a feeling that it is worth fighting for. Only when a goal is worthwhile, do we feel ready to make sacrifices. Only when we are convinced that the goal is good, can we muster our best energies in the work of achieving it. A worthwhile goal centres our attention. What we attend to determines largely what our behaviour is to be. When we are absorbed in a worthwhile task, we are too busy to worry or to be afraid. We are too preoccupied with the work in hand to quarrel with others. Our best powers are drawn into action. *Mental hygiene has no rule of thumb for living, but it offers some broad working principles. It suggests to us the enormous importance of selecting worthwhile goals from the beginning.* From these goals and purposes, we are to take our cues for action. In the beginning it is relatively easy to develop normal habits of attentive co-ordinated activity. The aim of educational hygiene is to suit the goal to the individual's stage of development and his peculiar needs. The ultimate goal may be obscure, but the immediate goals are clear, namely, the development of our superior abilities, individual and social.⁹

The Concept of Balanced Personality

About balanced personality, Klein¹⁰ states :

“The key word balanced refers to an avoidance of extremes, to finding the happy medium. As applied to dress and personal

9. loc. cit.

10. D.B. Klein, *Mental Hygiene: The Psychology of Personal Adjustment*, Henry Holt and Company, pp. 260-61.

appearance it calls for building up standards of 'good taste' allegiance to which will protect the individual from being catalogued either as an overfastidious, perfumed fop or as an unkempt, slovenly hobo. Neither the fop nor the hobo represent sartorial balance. As applied to learning the concept involves steering a middle course between crass, shocking, self-satisfied ignorance at one extreme and opinionated painfully detailed, complacent pedantry at the other. The pedant is unable to see the wood for the trees and the ignoramus sees neither the wood nor the trees—and both are unaware of this intellectual blindness. With respect to sex the concept implies adoption of an attitude of enlightened self-control that will enable its possessor to escape the difficulties of the over-inhibited, squeamish prude as well as the dangers of the overindulgent, prurient libertine. Both the prude and the libertine symbolise divergently extreme failures to achieve a balanced sex life. The prude is so afraid of sex that ignorant fear prevents appreciation of its beauty, while the libertine is so engulfed by lust that the beauty of sex is never cultivated. The one has too many inhibitions and the other not enough; hence both are off balance. Similarly, in connection with monetary matters balance suggests avoidance of both the Scylla of stinginess and the Charybdis of extravagance; for the miser's potential spending impulses are crushed by powerful inhibitions, while the potential saving habits of the spendthrift are never born because he is unable to curb the impulse to spend.

"Almost every aspect of personality reveals such distortion by failure to achieve optimal balance between the extremes of overdevelopment on the one hand and underdevelopment on the other. The aspect of religion furnishes the extremes of the smug, uncritical, supercilious, pietistic bigot along with his antithetic scoffer. A glance at the aspect of patriotism reminds us that a personality can be so fervently and chauvinistically patriotic that his country appears to him to be the apotheosis of all national virtue or, contrariwise, a personality can be so hypercritical of his country that he magnifies its vices and is blind to its virtues. Neither the jingo nor the 'copperhead' is an ideal patriot. If we turn to the aspects of communicativeness, we find both garrulous and taciturn individuals. The former are such chatterboxes that they bore others by their ceaseless stream of talk, while the latter are so silent as to make ordinary conversation a laborious undertaking. Here, too, there is a golden mean between saying too much and saying too little, just as there is between talking too loud and not talking loud enough or too rapidly and not rapidly enough. In analogous fashion personalities can be too aggressive or too meek, too excitable or too phlegmatic, too serious or too flippant, too ambitious or too apathetic. Even in terms of the personality's evaluation of itself the need for balance can be detected. The conceited egotist exemplifies an exaggerated evaluation while the discouraged victim of acute feelings of inferiority exemplifies the other extreme. What

we ordinarily call self-esteem refers to an optimal balance between these extremes."

The balanced personality is poised. For to be poised means to be balanced.

How Schools can Promote Mental Health ?

The chief mental hygiene task of the schools is not so much to prevent actual mental breakdown as to reinforce and amplify the functions of the ideal home in building up wholesome and socially constructive attitudes. In other words, what we have called the programme of meliorative mental hygiene should be the schools main concern with mental hygiene. This does not mean that an already crowded curriculum should be burdened with one more subject. We are not advocating the addition of a course in mental hygiene at either elementary or high school level. The scope of meliorative mental hygiene is such that it cannot very well be compressed within the confines of a series of lesson plans or formal school projects.

Mental hygiene is more like a philosophy of life than a fixed body of knowledge. A philosophy of life is not acquired by taking a course in philosophy. Nor is a philosophy of life ever finished. It is changed with and developed as new experiences makes for deepened insight and superficial values are discarded in favour of more profound values. Similarly, the mental hygiene perspective calls for adaptation all through the years as insight deepens and new problems loom up. But the basic setting for this perspective is rooted in the experiences of the developmental years in home and school. This setting is so pervasive that no array of pious mental hygiene maxims can furnish the child with the requisite knowledge. Schools can introduce fire drills and tooth brush drills and spelling drills, but not mental hygiene drills. Every class has mental hygiene implications. So does every good book, every friendship, every contest, every examination, every promotion, and every demotion.

The mental hygienist is more concerned about the attitudes built up in the child by school experiences—both curriculums as well as extracurricular—than he is with formal academic success. Every teacher has a responsibility for shaping and influencing the child's attitudes. Wholesome personality development of every child should be the fundamental educational objective. In terms of such a mental hygiene ideal it is just as important to adjust the school to the child as it is to have the child adjusted to the school. Mastery of the curriculum should be regarded as a means for enhancing personality development rather than as an end in itself. Existing curricula should be evaluated on the basis of their efficacy in furthering this goal. It is particularly important to consider their range and flexibility; for an extremely rigid curriculum of narrow content cannot be adapted to the individual needs of individual students.

Many of our so-called educational misfits are casualties of an unyielding curriculum. Very often it is the school rather than the child which is the misfit in question. Enlightened school officials have long been aware of this and have already made considerable progress in the difficult and expensive task of fitting the school to the vagaries of the individual child.

Even where lack of funds prevents an elaborate curricular change much can be done to promote child welfare as the mental hygienist views such welfare. The psychological atmosphere of the school can be made more like that of a congenial home atmosphere. The child ought to be made to feel safe and secure at home and at school. In a way the school is to be considered a projection and enlargement of the psychological values of the well-administered family. It is the child's training ground for communal living. To achieve the utmost from his activities on this training ground he must be given a sense of belonging to the school community. He must be made to feel a part of it just as he is made to feel his identification with the family group.

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ADJUSTMENT CONFLICTS AND MENTAL DISORDERS

Adjustment

THE relationship which becomes established among the biological heritage or organism, the environment, and the personality is adjustment.¹ The term adjustment refers to a harmonious relationship between the person and the environment. The degree of harmony depends upon two things : (i) certain potentialities within a person; and (ii) character of the environment. A person is said to be adjusted when he is so related to reasonably adequate environment that he is relatively happy, efficient and has a degree of social feeling. In simple words, adjustment is an all-inclusive term meaning relationship between an individual and his environment through which his needs are satisfied in accordance with social demands. The adjustment process is a universal sequence that can be identified in the behaviour of organism from the lowest species up to man. Boring² says that if a paramecium (single celled animal) meets an obstruction while swimming, it will pack up, turn through a small angle and swim forward again.

If individual's experiences have so shaped his personality that he is well prepared to play the roles which are expected of the status assigned to him within a given environment, and if his basic needs are met by playing such roles, then we say that he is well adjusted. On the other hand, if experience has not prepared him to play the roles of his assigned status, or if the environment is such that he is denied the normal status for which his experience has prepared him, and his fundamental needs are not met, then we say he is maladjusted.

1. Cf. Shaffer L.F., *Psychology of Adjustment* (Boston, Houghton Mifflin Company).
2. Boring, *et al.*, *Foundations of Psychology*, New York, John Wiley & Sons, Inc., 1948.

Needs and Goals in Adjustment

A need is a state of tension in the person which tends to direct his behavior towards goals which will relieve the tension. A goal is an activity which satisfies the need. There are various needs, for example, (i) organic needs i.e., food; (ii) personality needs, i.e., affection and belongingness; (iii) achievement; (iv) independence; and (v) social approval. Essential aspects of adjustment process are :

1. Existence of motive.
2. Circumstances leading to thwarting.
3. Varied response.
4. Discovery of solution.

As an example it may be said that an individual usually proceeds first in the direction of the goal; secondly, when he is blocked by an obstacle and makes varied response; thirdly, until he discovers some response and finally removes the obstacles and reaches the goal. It is a matter of common experience that adjustments are often complex and frustrative. When progress towards a goal is checked and there is unresolved tension, we have frustration. The consequences of frustration are many and varied. It may breed hostility and anger, destructive and aggressive impulses, delinquent and anti-social behaviour or it may lead to silence, restraint and withdrawal. Frustration breeds tense emotional states. Thwarting means non-fulfilment of aroused motive.

Frustration or thwarting may arise from various factors namely: (1) Physical factors in the environment; (2) social and societal factors; (3) economic factors; (4) personal defects; (5) incompatible goals; and (6) the person's normal standards.

Physical factors are obstacles from the environment which results in thwarting and frustration. In faminitic areas people are compelled to go without food and their hunger needs are frustrated by the food. A prisoner in solitary confinement is frustrated as his need for company is not fulfilled. Frustrations from the social environment are strong and persistent. We all desire to be appreciated, loved and respected. If this desire for love and respect is not met, the result is frustration. Unemployment, lack of security in employment, inadequate wages and harsh treatment by employers and lack of opportunities cause widespread frustration. Poverty also causes frustration. Krech and Crutchfield³ stress the role of society and cultural moods as the causal factors of frustration. They point out that often "the very needs which a particular culture itself induces are thwarted by the structures and the institutions of that society."

3. Krech and Crutchfield, *Theory and Problems of Educational Psychology*. (New York, McGraw-Hill Book Company, Inc.), p. 52.

A person with bad features is not usually liked. This causes in him frustration. Incompatible goals which a person is not able to fulfil also cause frustration. The last factor is the person's normal standard. Sometimes the high moral standard of the family causes frustration.

Methods of Adjustment

There are two methods of adjustment : one is direct and the other is indirect. These methods are used in an attempt to restore harmony between the individual and his environment. When a person has been frustrated, deprived or humiliated, he is likely to reduce the tension of the need by taking certain kinds of actions. These methods are also known as methods of tension reduction. These methods are always pointed out towards the relief of a feeling of distress.

Direct Method

Direct methods are always conscious. They are also rational. The needs for which satisfaction is sought are also conscious. They are typically employed to solve a typical problem once and for all. The direct method includes the following :

Renewed Attempts to Reach the Goal : The behaviour of Demosthenes may be cited as an example of this. This example can be called the example of direct action against a barrier of personal deficiency. Demosthenes was a Greek statesman who was unable to make better speeches because of a weak voice and a minor speech defect. It is said that he practised speaking with pebbles in his mouth and tried to strengthen his voice by shouting against the sound of the breakers on the sea-shore. In time he became a great orator and a famous statesman. This was a conscious attempt to reach the original goal i.e., to become a great orator.

Substitutions of other Goals

(A) If the attempt to reach the original goal fails, the person may consider a substitute goal. In many instances of vocational choice, one goal is consciously substituted for another. For example, a man who wants to become a physician or a surgeon, but is blocked by insufficient ability, may opt for the occupation of a laboratory technician as a substitute. Another example is that if married couples are unable to produce children, they resort to adoption.

(B) *Substitution of partial goal* : For example, a man who dreams of a palace, brings a few pieces of marble and keeps them in his house.

(C) *Apparent Substitution* : These are sometimes difficult to explain. The common example usually quoted is that of a wife

who having unsatisfactory sexual relations with her husband indulges in candy (crystallized sugar). Another example is of a girl who purchases a new dress. She has failed in the examination, by purchasing a new dress she may reduce her tension.

Analysis and Decisions

When a person is confronted with two or more motives or goals, he has to renounce one goal for another or he has to make a compromise. In simple words he has to make a choice between one goal or another. An M.Ed. student who is in Government service may be confronted with two goals viz., whether to do M.Ed. or to resign from Government service. Apparently, he has to renounce either the M.Ed. degree or Government service. He has to make a choice. Thus this is a conscious method of adjustment. Gates⁴ has given an example from a story of Somerset Maugham. In Somerset Maugham's story the hero had to face two strong incompatible goals. The goals were marriage with a girl whom he loved and giving up service. He was an ambitious and rising young diplomat. He fell in love with a girl of questionable character and reputation. Hence, he had to either give up his sweetheart and continue his career or marry her and give up his career. He ultimately decided in favour of the career.

Indirect Methods

Indirect methods are also called mechanism. They are distinguished from direct methods because (i) they are typically unconscious; (ii) they do not solve the adjustment problem once and for all, but only for a particular period. Indirect methods include: (1) sublimation; (2) withdrawal (including regression and day-dreaming); (3) identification; (4) becoming dependent; (5) rationalisation; (6) repression; and (7) projection etc.

1. *Sublimation*—Sublimation is a concept originated by Freud. Freud defined it as unconscious deflection of libido into other more socially acceptable channels. Libido means sexual instinct. Heterosexual love can be conceived of as consisting of a fusion of the needs for sexual activity, belongingness, affection and desire for care and to the need to be cared for. But activities which compromise the fused needs unconsciously are nursing, child welfare, social work, teaching, religious activities, friendship with persons of both sexes and the care of pets. Sublimation releases the tension. In simple words, sublimation is the process by which unconscious and unacceptable desires are channelled into activity that have strong social approval. The unacceptable desires are usually sexual in nature and their expression may be sublimated as creative efforts in music, art and literature.

4. Gates, et al., *Educational Psychology*, The Macmillan Company, New York, pp. 647-89.

2. *Withdrawal*—The primary object of withdrawal is to remove oneself from a distressing situation. The process may take many different forms and may vary in extent and in degree of performance. Examples are forest rangers whose is a solitary occupation.

3. *Regression*—Regression is the mechanism whereby the individual returns to an earlier and less matured level of adaptation. It is a reversion of progressive sequence of development and a return to primitive form of personality structure. This happens in schizophrenic patients who regress from the adult world to infancy and are unable to dress, wash and feed themselves. The other example is of a first born child in the family. The first child gets a lot of affection but when the second child arrives in the family he reverts to bed-wetting.

4. *Day Dreaming*—Day dreaming allows a person to achieve in infancy what he cannot achieve in reality. Day dreaming is always connected with specific frustrations. For example, a child, because of frustration by his parents, imagines that he is not their son or daughter but he is really the child of wealthy parents. Reverie is a reaction to boredom or monotony while day dreaming is likely to be connected with a specific frustration.

Forms of Partial Withdrawal

(a) *Avoidance or Limitation of the Situation*—Some individuals stay away from situations in which they have met defeats. A girl who has been humiliated at a dance party may avoid dancing altogether. (b) *Restrain emotional environment*—This is another type of partial withdrawal. One young man had fallen in love with a girl and this girl rejected him. Afterwards, he did not involve himself in any love situation. (c) *Procrastination*—Procrastination means avoiding a situation or postponing it. Procrastination is fairly common among those persons who hold that moral and religious perfection may be attained. Procrastination is rooted in inferiority feeling. Some students have a strong tendency to avoid a test because they are hyper-sensitive to failure. Persons who are not sure of being selected in an interview send applications after the due date. (d) *Plunging into a number of activities in order to become fully occupied with other needs*. For example, women whose dearly loved husbands have died become occupied in a number of religious activities. (e) *Becoming dreamy or sleepy*—This we find usually among children. (f) *Alcohol*—Persons who are frustrated take to drinking or wine and whisky.

Identification

Identification may be defined as a process by which the individual allies himself emotionally or feels himself one with another person or group. Usually the boy identifies himself with his father and the girl with her mother. This is a sort of hero worship.

Rationalisation

Rationalisation is most commonly found after failure to achieve a goal. Through rationalisation an individual justifies his undesirable behaviour. For example, if a boy does not get any response from the girl whom he loves, he may say that she is of bad character or the boy who comes late to school thinks that the clock is slow.

Repression

Repression is especially operative during early childhood. Repression is that part of a conflict situation which is most unacceptable to the Ego and Super Ego and may be forced to the unconscious by the Ego. Repression is the process of complete exclusion from consciousness of impulses, experiences and feelings which are psychologically disturbing because they arouse a sense of guilt or anxiety. Repression always solves unconscious conflict. It must be distinguished from suppression. Suppression is the conscious control of undesirable impulses, feelings and experiences. Repression is also to be distinguished from inhibition. In inhibition the individual consciously and purposely refrains from any activity.

Projection

There is a tendency for all of us to seek our faults in others. This is projection. In projection the individual protects himself from awareness of his own desirable traits or feelings by attributing them to others. Projection is the inverse of introjection.

Introjection

Introjection is like identification except that in identification the individual wants to be like the object while in introjection he considers the individual a part of himself. In schizophrenic patients the individual believes that he has ability of others.

Reversal Formation

Reversal formation means conscious attitudes which are partially repressed. For example, a girl who is of bad character will say that she is being teased by boys or a bride will become angry with her husband when the child arrives in the family too early.

Aggression

Aggression is a method of reducing tension. It is not an inborn drive. It springs only from frustration. It may also arise from being humiliated. This is a recent theory. Previously it was considered to be an inborn tendency. For example, war could never be abolished because of the aggressive drive. It does not follow either

the direct or indirect methods. Gates⁵ gives us the following examples of aggression.

He says that a child wants to go outdoors and play but is prevented from doing so by his mother. It responds by becoming angry and striking her. A precise analysis of this little episode reveals several features :

(a) The child has an urge to go out to play. Play is its present goal.

(b) Mother frustrates it by preventing it from achieving its goal (to play outdoors). This has the effect of producing in the child an immediate impulse to aggression, in this instance an impulse to strike its mother.

(c) Now the child has two tensions : that of the need to play outdoors and that of the need for aggression. The goal which would satisfy its first need has been blocked by its mother, but the second goal, that is, to express its aggression by striking its mother, is not blocked.

(d) Consequently, the child responds by striking its mother, and thereby achieves the goal of its urge to aggression.

(e) Presumably this direct aggressive action satisfies the need for aggression and has the effect of discharging all tension connected with this secondary urge.

(f) The child, however, still has in full force its need (and the tension which accompanied it) to go out and play, which was originally thwarted by its mother. In short, striking its mother does not solve his original problem.

If aggression is turned inward it becomes dangerous.

The Dynamics of Psychological Adjustment of the Child

It is not our intention in this chapter to cite the many areas of psychological adjustment in which children may fail to meet the demands of our culture. Rather, we plan to describe some of the principles of psychological adjustment that may be applied to all areas of child life. These principles of adjustment are applicable to the molar, or goal-oriented, aspects of child behaviour. The dynamic features of psychological of the child are presented below :

1. We have a striving organism. The child is motivated to action by certain primary or secondary needs. These needs stimulate either covert or cover behaviour patterns which are selective on the basis of maturation (unlearned patterns) and or transfer from previous experience. (The manner in which these needs are met, or the manner in which striving

5. Op. cit, p. 680.

behaviour declines without 'adequate' need-reduction defines the primary features of the adjustment process).

2. These behaviour patterns of the child become directed toward some goal which shows promise of satisfying his needs. The selection of appropriate goals is an extremely complex aspect of psychological adjustment, involving perceptual-growth-status, emotionalized attitudes, social values, level of aspiration, and numerous other variables. (The maladjusted child from a social-reference standpoint is often the child who selects socially verboten goals to satisfy his needs. From a personal point of view his immediate adjustment may be satisfactory; i.e., he is able to satisfy his current needs. However, the attainment of socially forbidden goals typically makes it difficult for him to satisfy other needs in the future.)
3. The child's efforts to reach this goal (which promises to satisfy his needs) are frustrated by a barrier of some kind. In a general sense, there is always a barrier between the child and the attainment of a goal, even if this barrier is nothing more than a minor expenditure of energy to raise his arm, blink his eye, or swallow food placed in his mouth. The barrier to a behaviour sequence is frustrating to the degree that it bars the child from direct and immediate access to the desired goal. The amount of frustration experienced by a child when confronted with a barrier is also a joint function of the intensity level of his needs and the desirability or adequacy of the chosen goal for satisfying his needs.
4. The resolution of this frustrating state of affairs defines the social and personal adequacy of the child's immediate psychological adjustment. If the child can attain the goal (or a personally acceptable substitute goal) and thereby satisfy his need, he has made a healthy personal adjustment. If this attained goal is also socially acceptable, he has made a personal-social adjustment. All other resolutions of the conflict situation are maladjustive in nature.
5. The behavioural consequences of an inadequate resolution of a conflict situation are typical of personal-social maladjustment. Although we must admit that a child is making one kind of psychological adjustment to a conflict situation when he 'throws a temper tantrum,' his adjustment is likely to be inadequate from both a personal and a social point of view. His original needs which precipitated the conflict may be little altered by this form of behaviour. Furthermore, as a consequence of this behaviour, his parents, teachers, and peers may place additional barriers between him

and other goals that he will seek in the future. This latter is one of the most pernicious features of maladjustive behaviour. It frequently initiates, maintains, and augments a vicious circle of inadequate and inappropriate responses.

Symptoms of Chronic Maladjustment

The following kinds of behaviour may be symptomatic of major maladjustment:

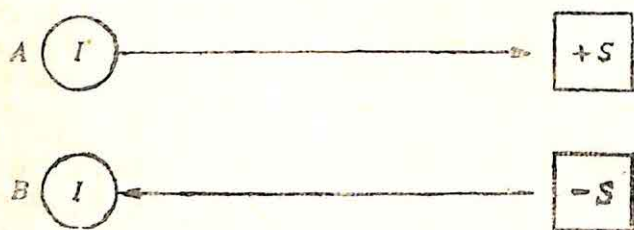
1. Extreme restlessness, easily excited, destructive tendencies towards people and things, frequent emotional upsets, constant day-dreaming, feelings of 'differentness' extreme tenseness, feelings of inferiority, abnormal fears of many things, preference for playing alone, stubbornness, resentful of criticism, excessive sulking and pouting, feelings of inferiority, feelings of great importance, tendency to bully other children, constant need for attention; inability to work hard on anything, repeated truancy and inability to make decisions.
2. The physiological symptoms of chronic maladjustment may take the form of reversals or complications in toilet habits; the development of nocturnal enuresis, obstinate constipation diarrhoea, excessive urinary voiding, and so forth. Chronic maladjustment is also frequently reflected in feeding disturbances, obesity and anorexia.
3. Non-pathological withdrawal is characterised by the following kinds of behaviour : (1) the child prefers solitary activities at the expense of social interactions; likes to read, listen to music, go to the movies, collect things, and the like in the absence of other children and adults; (2) the child prefers to make his psychological adjustments on the irreality level : likes to day-dream about a romantic and glorious future for himself, about being loved by his friends, about defeating his 'enemies' and about satisfying all of his psychological needs that are difficult to satisfy on the 'reality level. Most of these behaviour patterns are displayed at one time or another by all children.
4. The nervous habits in children living under conditions of extreme psychological stress usually appear as various combinations of the following kinds of behaviour : thumb sucking, finger-nail biting, nose picking, head scratching, head banging, face rubbing, nervous finger movements or hand wringing, restless pacing, frequent crying over minor circumstances, body rocking, lip biting, facial tics and/or grimaces, nervous singing or talking in the absence of others, frequent urination, and the like.

Conflict

Conflict has a broader significance especially in understanding maladjustment. Conflict has been defined as a state of mind in which two or more incompatible behaviour trends are evoked that cannot be satisfied fully at the same time. In recent years psychologists have given much attention to the problem of conflict. Conflict is one of the types of thwarting. Frustration occurs in the individual as a result of the blocking of motives or by conflict. Conflict is usually a clash of motives. Conflict has been described in terms of interactions between the individual and his environment. This is the field of theory of behaviour, developed by Kurt Lewin.⁶ It emphasises the observation that behaviour does not depend upon the organism alone or on the environment alone, but what goes on between the two. Kurt Lewin says that tendencies behaviour may be represented by vectors which show the direction and strength of the individual's striving. Most impulses can be described as directed towards or away from an environmental event. This is stated in terms of valences of which positive (+) valences are tendencies to approach, and negative (—) are tendencies to withdraw and avoid. Valences and vectors are both field phenomenon and can be defined only in terms of both the character of the person and the environmental forces acting on him.

Types of Conflict

Field theory shows that there can be only three basic types of conflict :



VALENCES AND VECTORS

In A, the interaction of the individual (I) and the situation (S) may be described as a positive valence, in B as a negative valence. (After K. Lewin.)

(1) Approach-Approach conflict; (2) Avoidance-Avoidance conflict; and (3) Approach-Avoidance conflict.

6. Kurt Lewin, *A Dynamic Theory of Personality*, McGraw-Hill Book Company, Inc., New York.

1. Approach-Approach Conflict

The conflict is between two positive valences that are equal in strength. A child may have to choose between reading an interesting book and going out to play football. Approach-Approach conflict is a conflict between two equally attractive choices. The examples are : should I go to see a picture with a girl friend or play a tennis match with a prominent player of the college ? This type of conflict may also be understood as double-approach-avoidance conflict. Girls in India have to face this type of conflict very often. Sumitra is a bright student in the college and is very keen to take a Ph.D. degree. It has always been her ambition to qualify for economic independence. But there is a prospect of marriage in a very respectable family and to a young man who seems to have everything a girl may aspire to in marriage, but who insists on immediate marriage. It appears that she has to choose one of the two attractive alternatives and is faced by approach-approach conflict. But each alternative is linked with a penalty. If she selects the goal of the Ph.D. degree and continues to study she has to forego a tempting offer of marriage which she may or may not get again, and if she chooses marriage she will never get the degree she has so ardently

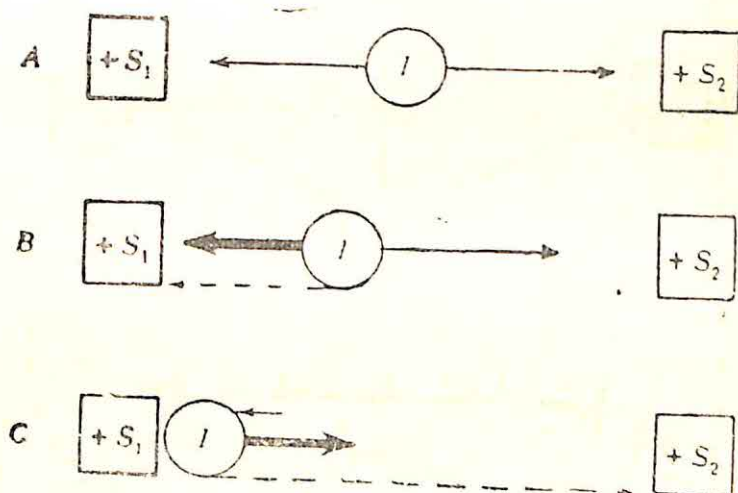


FIGURE 1

Approach-Approach Conflict

The approach-approach conflict, A, is solved easily. If some variation in behaviour brings the individual a little closer, physically or psychologically, to the attracting situation S_1 and away from the other attracting situation S_2 the conflict is resolved by the individual's going in that direction (B). In C, satiation of the S_1 motive may weaken its vector. The individual then vacillates to the S_2 motivational forces (After K. Lewin).

desired all her life. So the element of avoidance is there. (See Fig. 1).

2. Avoidance-Avoidance Conflict

Conflicts of this type are evoked by two negative valences. Both tendencies are to retreat from or to avoid something. In simple words, the individual is caught between the devil and the deep sea. For example, a young boy may want to avoid doing an unpleasant task and also want to escape a threat of parental punishment, or a soldier in battle may have a conflict between his need to run away and save his skin and his need to avoid being dubbed as a coward.

The most usual solution of Avoidance-Avoidance conflict is the living field i.e., to take a third course of action. Most escape mechanisms are methods of leaving the field. The boy whose example has

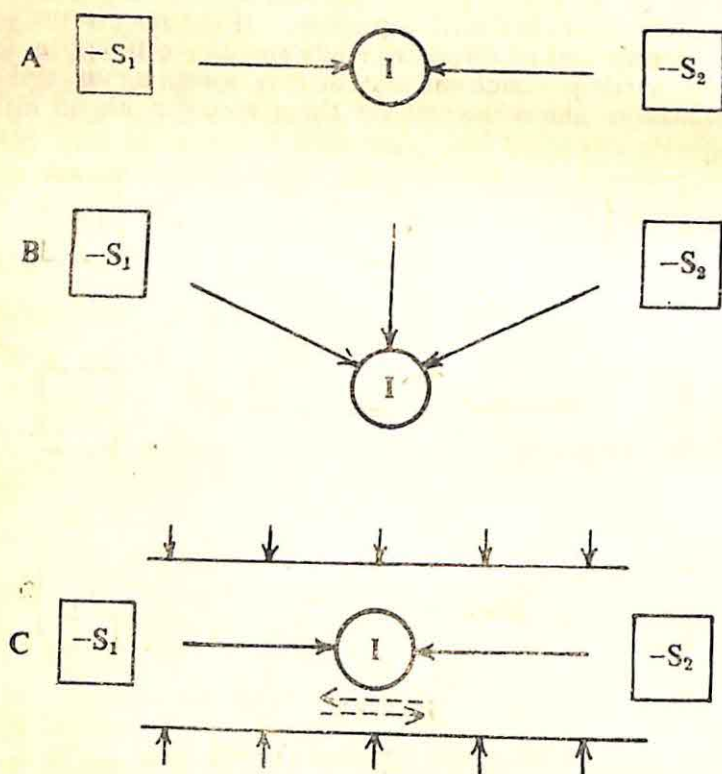


FIGURE 2
Avoidance-Avoidance Conflict

The usual response to this type of conflict in A is to leave the field, as shown by B. If material or psychological barriers prevent this, as in C, the individual shows vacillating behaviour (two dotted vectors at the choice point, and the unreduced tension (After K. Lewin)

been given by us may develop a headache thereby avoiding both the task and parental displeasure or he may apparently work at the job but really be engaged in day-dreaming, which is a common way of escaping the unpleasant alternative. If this conflict is not solved it results in nervousness or anxiety and the like. (See Fig. 2)

3. Approach-Avoidance Conflict

In this type of conflict, approaching and avoiding tendencies are evoked simultaneously. For example, a child wants to play football but is afraid of being hurt or when it loves and fears his mother. Approach-avoidance conflict cannot be solved by leaving the field because the impulse for approach (positive valence) keeps the individual from retreating. An example may be that a young man from a very orthodox family is invited to a dinner at a modern hotel. He has been brought up in a family which looks down upon non-vegetarian food served in chinaware outside the kitchen. Nor has he ever eaten with shoes on with people of other castes and communities. He, therefore, looks upon such an invitation with anxiety, if not fear that he would lose his caste and incur the displeasure of his parents for indulging in a dinner which is considered impure and irreligious in his family. On the other hand, he does not wish to

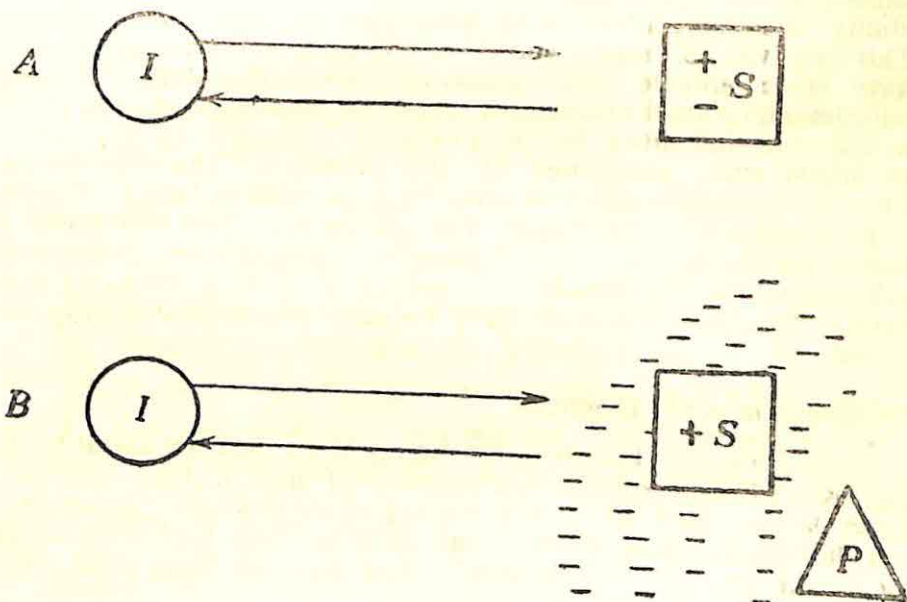


FIGURE 3

Approach-Avoidance Conflict

An unresolved approach-avoidance conflict in 'A' results only in unreduced tension, since leaving the field is not a solution. In many instances this type of conflict results from induced valences, as shown in B, where a parent (P) forbids an approach, surrounding the desired goal (+S) with an atmosphere of negative valences (After K. Lewin)

look old-fashioned and backward in the eyes of his friends. The attitudes and values of his parents have become his own and he is caught between the desire to be called modern and his orthodox attitudes and values. The first attracts him and the second frightens him. In a way, the type of conflict is most difficult to solve, because the attitudes and values which obstruct his behaviour have been adopted by him through social training in childhood as his very own; that is, they have been internalized. And it is most difficult to avoid such obstacles.⁷

Approach-avoidance conflict often leads to inferior adjustment or unreduced anxiety.

Fact of Conflict

Life is a series of conflict situations on the basis of which the personality is formed. Some of the conflicts pointed out by Freud are those between pleasure seeking and reality, love and hate, passivity and activity. Growth towards maturity is dependent upon the individual's success in solving these conflicts. The cause of conflicts may arise from personal insufficiency such as inadequate intelligence, lack of physical strength, and disability and disease. But the fact cannot be avoided that conflict has some effect on the individual's ability to adjust. Meserian has conducted experiments on cats. This is a valuable study and these experiments on conflict in cats have made valuable contributions to the understanding of human adjustment. Conflicts are not only the precipitating causes of adjustment difficulties, but also have a relationship and the ability to adjust when confronted by new problems. The experiments show that strong, unresolved early conflicts make enduring changes in personality and case studies of people confirm these findings. If a person persists over a period of years in making inferior excessively substitutive or non-adjustive responses, it is very probable that earlier disabling influences have reduced his general ability to adjust.

Common Sources of Conflict

In infancy and childhood, the family being the chief social background of the individual, it is the scene of most of these conflicts. Later on sex comes to determine many of the conflicts for the reason that the demands of our culture have not been well adjusted to the sexual needs of the individual. And there are many other ways in which cultural values can give rise to conflicts.

Family Conflicts

1. Interaction of personalities that take place within the family i.e., child's relations with members of the family.
7. Bhatia, H.R., *Elements of Social Psychology*, Manaktala, Bombay, p. 77.

2. Conflicts of insecurity. Insecurity is due to the conflicts of fear and dependency. If parents are cold and demanding the child feels rejection. This has a very bad effect on the child.
3. Parent's wrong handling.
4. Feelings of inferiority.
5. Conflicts also arise from sibling rivalry.
6. Over protection or parental submission.
7. Underprotection.
8. Bad personality results from constant financial strain.
9. Unattractive children.
10. Parents who have high moral standards.

Sex Conflicts

1. Gap between physical and social maturity. A person may want to marry earlier but parents may not agree.
2. Sexual needs and the sense of guilt.
3. Lack of manliness or unattractiveness.
4. Too strict early training.
5. Guilt of masturbation.
6. Difference between Indian culture and Western culture.
7. High personality or morality.

School Conflicts

1. Over competition in school.
2. Over restriction in the classroom.
3. Teacher's method of handling in the class.
4. Teacher's report of behaviour problems in the classroom.
5. Children with special problems of adjustment : the sickly child, the child with sensory defects, the intellectually gifted child, the dull child, the isolated child, the inferior child and the delinquent child.

Concept of Wholesome Personality

A wholesome person is a person who is physically strong and healthy, who is mentally alert, who is emotionally stable and whose home and school environment are well fitted to his needs and interests. Wholesome personality is one whose "concept of a self is realistic in that what he thinks of himself, agrees closely with what others think of him and with his achievements. He enjoys a kind

of minor harmony when there is a degree of integration of his intellectual and emotional capacities. Children who are well-adjusted come from homes that are happy places, where discipline is used for more far-reaching purposes than merely deterring wrongdoing, where responsibility is a part of the routine of life, where the family enjoys recreations together, and where family relationships and attitudes towards children are wholesome. In such homes, children learn to take responsibilities on their own level, to be independent and take care of their own needs, to solve their own problems and to be well-adjusted, adults must know not only how to create a good environment for children, but once it is created, they must know how to maintain it.⁸ Thus, a person who does not suffer from anxiety and chronic discomforts, possesses normal personality.

In wholesome personality there may be two aspects viz., functional and social. If the functions of an individual are well, he may be called well-adjusted because in functioning well there is a need of organised and whole personality. He thus acts with his whole mind and also wholeheartedly. This does not mean that juvenile delinquents, who may work with their whole minds, are also well-adjusted personalities. The reason is that they act against the society and are anti-social. So social factor also plays an important role in wholesome personality. A wholesome personality will never commit anti-social acts.

In conclusion, wholesome and well-adjusted personality is characterised by the harmony between the needs of individuals and demands of the environment.

Disorganised Personality and Mental Disorders

Disorganised personality means psycho-neurosis. If the adjustment of the child is inadequate, he is maladjusted and inefficient; if he has chronic discomforts, then he may be called possessing a disorganised personality and is also known as a neurotic patient. The development of neurosis is due to the result of early patterns of personality adjustment in which inadequate balance exists between the drives of the individual, (the Id) and the counter drives, (Ego and Superego). Despite their differences some types of neurosis have much in common such as defences, repression, displacement, reaction formation, and rationalization. There are, however, varying differences of opinion concerning the significance of these drives.

For example, Karen Horney suggests that in our culture the expression of hostility is of basic importance in personality integration, and that when it is inadequately expressed neurotic conflict results. Harry S. Sullivan emphasises the importance of the establishment of self-esteem if neurotic behaviour is to be avoided.

8. Elizabeth B. Hurlock, *Child Development*, New York, McGraw-Hill Book Company, Inc., pp. 572-73.

Recently W.V. Silverberg has stressed the importance of both inner and external sources in the development of self-esteem as well as the effective expression of hostile attitudes. When these are thwarted in their expression neurotic behaviour results.

According to present knowledge, neurosis may be defined as follows:

1. A high degree of *repetitiveness* which is irrational in nature.
2. Lack of true insight into the cause of the behaviour.
3. Conflicting drives which contribute to anxiety, self-disapproval and tension.
4. Impairment and reduced effectiveness in some physical functions.

Psycho-neurosis is also characterised by anxiety, that anxiety which hampers social adjustment.

A distinction can be drawn between 'fear' and 'anxiety'.

"Fear is a 'catastrophic response' that all persons make when faced with a highly motivated situation to which they can make no effective adjustment.

Anxiety is distinguished from fear in that it is a response to an anticipated danger, or to a symbol of one, rather than to the threatening situation itself. Normal anxiety is present when the anticipated peril is imminent and probable. It is sometimes called *situational anxiety*, for it is relieved when the situation that aroused it is past. For a military aviator in wartime to suffer a severe emotional disturbance, when under enemy fire, is normal fear. For him to show signs of emotion as he contemplates the next combat mission is normal anxiety. But if in time of peace and in the safety of his own country, he trembles when an automobile backfires, or if he breaks into perspiration, when someone slaps him on the back, he is showing neurotic anxiety."⁹

Types of Neuroses

(i) *Anxiety Neurosis* : This refers to the apprehension of danger by people e.g., a student near the examination hall begins to think that he might fail in the examination. Anxiety neurosis frequently results in various disagreeable and sometimes quite painful bodily sensations. The most common of these are :

1. Difficulty in breathing.

9. Edwin Garrigues Boring, *Foundations of Psychology*, New York, John Wiley and Sons, 1948, pp. 531-32.

2. Pain in the region of the heart.
3. Palpitations.
4. Dizzy spells.
5. Increased perspiration.
6. Generalized weakness and exhaustion.
7. Pains and cramps in the stomach.
8. Headaches.

What does a person who is anxious complain of? The most common complaints are :

1. Fear of indescribable danger.
2. Fear of impending illness.
3. Irritability.
4. Insomnia.
5. Restlessness.
6. Loss of appetite.
7. Sluggish thinking.
8. Feeling of confusion.

What are the common signs observed in persons experiencing anxiety?

1. Cold, moist hands and feet.
2. Dry mouth and lips.
3. Variations of rate of the pulse.
4. Variations in blood pressure.
5. Tenseness.
6. The abdominal muscles are still and tense.
7. The reflexes are exaggerated.

If anxiety continues for any length of time it is likely to affect the various organs of the body—the heart, the stomach, the blood vessels, etc. At first these changes may be of a temporary nature, but if the anxiety persists, the organs may undergo structural changes. When anxiety is prolonged and abnormal it is indicative of emotional illness.

(ii) *Neurasthenia or hypochondria*—It means when our bodily organs are upset, e.g., when the examination approaches fast, some of the students develop fever. This upsets their internal organs.

According to Nice,¹⁰ neurasthenia is characterised by fatigue, dullness, depression and lack of interest, and may be found in the hypochondriac, and the hysteric, compulsive or anxiety state. There is a question as to whether it should be listed as a specific syndrome. There are, however, a large number of neurotic patients whose symptoms centre around complaints of fatigue. This fatigability also extends to the mental aspects of the individual's life. The fatigue of the neurasthenic differs in several ways from actual physical fatigue. Firstly, neurasthenia is not due to actual physical exertion. Weeks of rest and idleness do not alleviate the symptoms.

Another characteristic of the disease is the presence of somatic symptoms. Binding sensations of the neck and shoulders are common complaints. Lack of sleep and loss of appetite are also common features.

The question of etiology is much involved. Heredity has long been considered as an important factor since mental disorders are found to be numerous in the ancestry of the neurasthenic patient. However, this can be taken with a grain of salt for we have no record of the prevalence of the disease in the ancestry of non-mental patients.

The nature of the continued emotional tension provides an adequate explanation for the symptomology of the neurasthenic patient. Although the normal individual often exhibits the same symptoms the neurasthenic patient tends to retain the ills despite adequate sleep and rest. These symptoms may last for days or even weeks and in some severe chronic cases it is known that it lasted for years in the form of chronic psychological invalidism.

(iii) *Nervousness*—It is due to motor symptoms i.e., when hands tremble, fingers do not work etc.

Phobias

Phobias are real expressions of anxiety as compared with normal fears. When fear is attached to a specific type of situation, it is called phobia. "Mild phobias, which are very common, may be stimulated by almost every kind of situation imaginable. Among the more common phobias are fears of the dark, of small enclosed places, of heights, of animals, of crowds, of water and of thunderstorms . . . A person with a phobia admits that his fear is groundless but he is unable to control it. Although many normal people have minor phobias, the condition is regarded as psychoneurotic when it is severe and of long duration, and when it interferes with ordinary life activities to an appreciable degree."¹¹ According to Nice phobia is a fear of something which is not objectively a source

10. Nice, R.W., *A Handbook of Abnormal Psychology*. Vision Press Ltd, 1959.
11. Edwin Garrigues Boring, *Foundations of Psychology*, New York, John Wiley and Sons, 1948, p. 533.

of danger, but which the individual reacts to with real fear despite the fact that he realizes this reaction is inappropriate. A phobia is an unrealistic and persistent fear, the origin of which has been forgotten.¹²

There are two theories regarding the origin of phobia: the conditioning theory and the dynamic interpretation theory. According to the conditioning theory in phobias, there is an emotional traumatic episode, feeling of guilt, repression from consciousness of the experience, and subsequent upsets whenever the individual is exposed again to the circumstances of the original emotional trauma.

In general, the dynamic theory holds that the phobia is a defence mechanism through which the individual gets rid of anxiety-arousing impulses. An unconscious impulse arouses an emotional state, this impulse is repressed, but the emotional state continues. The individual tries to explain his emotionally aroused visceral tensions, and their causes, and seizes upon some object, situation, or idea as the explanation. A real situation can be handled through avoidance, whereas the impulse, being unconscious, cannot be dealt with.

Thus the phobic individual purchases freedom from anxiety by avoiding certain objects or situations. If, as the conditioning theory maintains, phobias result from one or more fear-producing episodes, the individual should, by avoiding the fear producing object or situation, be free from anxiety and the whole problem would end there. It is here the conditioning theory fails as an explanation for phobic anxiety. It may be a progressive maladjustment which continues to operate and spread to other objects and situations. Anxiety attacks occur in many situations and each situation is seized upon as an explanation of the attack. Eventually, if the attacks continue, the patient becomes a "phobic prisoner", finding no situation, even his own home, which does not provoke a fear response. A phobia is a psychological neurosis but as in neurosis the method of relief eventually becomes the disease itself.

In summary, a phobia is a morbid fear brought on by some experience in the past. It is a defensive mechanism against continual, severe anxiety.

Obsessions—When a compulsion occurs in connection with a phobia, its adjustive value is seen most clearly. To an individual who has a fear of being attacked in the night, tension is obviously reduced by examining all the bolts and locks repeatedly and by making several inspections of closets and under the beds. A compulsion is a routine that gives a sense of security . . . An obsession is a compulsive thought that keeps recurring, even when the person tries to banish it. The obsessive thought is annoying, sometimes because it is distressing in itself and sometimes because it seems

12. Nice, op., cit., p. 99.

foolish and irrational,¹³ e.g., washing hands again and again and still not being satisfied. There are a number of characteristics that denote obsessive compulsive neurosis. These are:

1. Compulsive rituals (e.g., hand-washing rituals).
2. Obsessive fear of dirt and germs (usually accompanied by cleansing and tidying rituals).
3. Obsessive fear that the patient may harm someone (usually accompanied by precautionary rituals).
4. Compulsive need to count, or repeat verbal formulae.
5. Obsessive rumination about trivial or irrelevant matters.
6. Compulsive drive to work, or to busy one's self in some activity.
7. Compulsive attendance to detail, often at the expense of the broader, more important aspects of the task.
8. Compulsive adherence to high standards of work, or morality or to regulations.
9. Pseudo at suicide.
10. Compulsive avoidance of feared situations (e.g., crowds) or obsessive fear of certain situations.
11. Compulsive habit of mannerism (e.g., tics).
12. Obsessive hypochondria.
13. Compulsive avoidance or obsessive fear of people.
14. Obsessive fears of being poisoned, swindled, attacked.
15. Obsessive doubts; vacillations and worrying.
16. Compulsive sexual behaviour (e.g., masturbation).
17. Compulsive aggressive or emotional outbursts (e.g., nagging or temper tantrums).

Compulsive behaviour is never modified by experience; it is repeated time and again for no logical reason. The individual cannot help behaving as he does. Some unconscious force or tension compels him to express his repressed needs or conflicts in distorted form. All neurotic behaviour, and much normal behaviour, is compulsive in this general sense.

Psychoses

"The most seriously non-adjustive conditions are the psychoses, popularly known as *insanities* or *mental disorders* . . . A psycho-neurotic person is a discomfort to himself and may be a nuisance to

13. Edwin Garrigues Boring, *Foundations of Psychology*, New York, John Wiley & Sons, 1948, p. 534.

others, but a person with a fully developed psychosis is dangerous to himself and to society. Psychoses are more common than is ordinarily realized."¹⁴

Types of Psychoses

(a) Organic Psychoses

These are the disorders "caused by identified organic conditions. They include brain injuries, syphilis of the nervous system, chronic addiction to alcohol and other drugs and brain deterioration associated with old age."¹⁵

(b) Functional Psychoses

It means lack of appreciation of reality. It is further classified into the following sub-divisions :

(i) Schizophrenia or Dementia Praecox

"It has a seclusive personality with marked abnormality in the development of emotions and feelings. The patient manifests a gradual blunting of emotions and growing indifference towards persons and things. Situations that would arouse emotions of sorrow, anger, etc., leave him absolutely cold. If the news of his mother's death is conveyed to him he just mumbles 'That's rather bad; isn't that so ?' and again withdraws into his shell. The patient does not appear to be in contact with reality and he is completely lost in his dream-like ideas . . . The most acceptable theory is that "Schizophrenia is the result of the failure of an individual to make an adequate adjustment to his environment."¹⁶ The patient may break out suddenly with emotional violence.

(ii) Manic-depressive Psychosis

"It consists either of overactivity and an elated feeling tone in the manic phase or of retardation and sadness in the depressed condition. Usually, a patient has an attack in one or the other of these forms, and then recovers . . . It has been suggested that manic-depressives are persons who have never learned how to compromise, who are either completely defeated by conflict or else deny it by an unreal elation."¹⁷

14. Edwin Garrigues Boring, *Foundations of Psychology*, New York, John Wiley & Sons, 1948, pp. 535-36.
15. *ibid.*
16. Kothukar, V.K., and, Haroeikar, L.B., *Elements of Psychology: Normal and Abnormal*, Orient Longmans Limited, 1961, p. 203.
17. Edwin Garrigues Boring, *Foundations of Psychology*, New York, John Wiley & Sons, Inc., 1948, p. 537.

(iii) *Hallucination*

It is when a person behaves in a silly or incoherent manner that he suffers from hallucination, e.g., a person who laughs or cries for nothing when there is no observable reason.

(iv) *Delusions*

"Delusions or false beliefs held without reference to reality occur frequently in schizophrenia. The most frequent delusion is persecution. The patient declares that he has been robbed, cheated or imprisoned by his family, or that people have conspired to cause him to lose his position. Delusions help to explain defeats and to build a sense of importance. They are tolerated by the patient because his distorted perception of reality prevents their critical appraisal."¹⁸

Comparison of Seven Characteristics in Psychoneurotics and Psychotics¹⁹

<i>Characteristics</i>	<i>Psychoneurotics</i>	<i>Psychotics</i>
Etiology	Psychogenic factors are of primary importance; hereditary factors are undetermined.	Constitutional and/or hereditary factors are critical in most cases; neurological and toxic factors are often determining agents: psychogenic factors are contributory.
General Behaviour	Speech and thought are logical and coherent; loss of contact with reality is limited; delusions and hallucinations are not observed.	Speech and thought processes are incoherent; behaviour is bizarre and irrational; delusions and hallucinations are common.
Social Adjustment	Behaviour is in general conformity with accepted standards of society.	Social habits are lost; behaviour is at odds with accepted standards of society.
Self Management	Can manage self, although they are not always self-supporting; suicide is a possibility.	Institutionalization is usually necessary to prevent harm to self or others.

18. *ibid.*, p. 538.

19. After James D. Page, *Abnormal Psychology*, New York, McGraw-Hill, 1949, p. 101.

Insight	Frequently is good.	Is partial at best, frequently totally lacking.
Treatment	Psychotherapy is the treatment of choice.	Emphasis is on controlling behaviour with chemical and physical agents prominent; when contact is established, psychotherapy should be used.
Prognosis	No deterioration: improvement can be expected.	Deterioration may be present in chronic cases; previous high incidence of life time hospitalization is being lowered.

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BACKWARDNESS AND REMEDIAL INSTRUCTION

The Problem and its Importance

BACKWARDNESS of any form is a great individual calamity. This acquired or inherited disability induces many pervasive psychological reactions, chronic sorrow and many neurotic reactions in an individual. It makes life tragic and reduces a person to great disability and invalidity. As a handicap, backwardness disables an individual to participate actively and competently in the social and vocational spheres and it just reduces him to a status of almost a parasite who needs to be ministered by family members and other officials and private agencies. Different levels and types of backwardness are likely to create different types of problems and hence a different type of handling is essential. The work on the field of backwardness by general medicine, psychiatry, psychology, education, social work, and speech and hearing are all well-established areas of endeavour of unquestioned significance. These endeavours have given a circumscribed, long-established professional identity to the problem. Backwardness among students is a problem of great magnitude as it involves millions of pupils who form a substantial portion of the population of this country. The recognition of the problem of backwardness by parents, teachers, and others who are involved in the welfare of the backward, is the first task that needs attention from them all.

In India, the problem of backwardness is a problem of great magnitude. According to the first All India Seminar on the Education of the Backward Child,¹ there were probably a million under-achievers out of 20 million children in 20,000 secondary schools of India. Due to their heavy number, the wastage, on account of the backwardness, was a problem of great magnitude in the country. In other countries, the problem of backwardness is also equally big. According to Birkett,² there were as many as 20 per cent of children who tended to fail in their studies, relative to the average standard

1. *Education of the Backward Child*. National Council of Educational Research and Training, 1964, p. 4.
2. *ibid.*, p. 4.

set by their age group, to such a degree as to justify the designation of backwardness.

The failure in the school work may be as much due to the intellectual dullness of the pupil as due to lack of interest. According to some, there is no sharp line of cleavage between the dull and the normal or the normal and the bright as the mental differences are only that of degree and not that of kind. But the problem of backwardness in school, whatever its type or degree, is also a problem of individual differences among children.

Schonell³ states that backward children, including both dull and not dull form roughly 10 per cent of the school population of Britain although this figure varies from 5 per cent, in some areas, to 27 per cent in others. The average amount of backwardness, both general and specific within the schools is approximately 15 per cent. All said and done, backwardness among pupil population is a universal problem.

In a highly technological and industrial era, where talents are very much needed, dissipation of human resources is a great problem. In India particularly, when she is trying to establish herself technologically and industrially, wastage of human resources caused by backwardness among pupils is a problem of considerable significance. National surveys of intelligence tend to suggest that every country has a limited pool of ability. There are no abundant persons with highly mentally-endowed powers and abilities, whereas the number of those with dull and retarded intellect are many. The utilisation of manpower is an essential prerequisite for the economic and industrial revival of the country. Since technological progress leads to the maximum and healthy industrial production, the fostering of necessary skills among the pupils is inevitable. Taking the long-term view, the fostering of skills among those who are less well-endowed intellectually has to be the primary concern of all us.

For backward children, life offers a perpetual threat, as being devoid of many normal abilities and skills, they are unable to cope with it. They belong to a world of under-achievers and as such their handicaps expose them to constant unhappiness and to a long continued frustration. This being so, early detection of their difficulties should be a primary task at schools. An effort to get awareness of their needs and a knowledge of their handicaps should enable schools to offer remedial help which is a way to overcome their problems.

As a social problem, the care and education of backward children is of utmost importance and significance. Backward and

3. Schonell, F.J., *Backwardness in the Basic Subjects*, Oliver and Boyd, London, 1949, p. 4.

handicapped children suffer from many physical, mental, moral and emotional disabilities. They are unable to be effective in society on their own or to undertake duties requiring independence and judgment. Their life revolves, usually, round their own disabilities rather than their abilities, if any. Unless special educational facilities and services are offered to them by way of special education and training, where emphasis is based on cultivation of simple skills, through, special teaching programmes, an individuality cannot be easily fostered in them. Cultivation of independence is not possible unless there is maximum integration of their functions. On their cognitive level, they exhibit deficiency and their understanding is shallow. They generally display lack of higher mental thinking.

At times, a layman, who does not have sufficient background of the etiology of backwardness, may be confused between backwardness, caused by mental retardation and that caused by mental illness. They are altogether two different entities and the two concepts have distinctly various meanings in psychology. Mental illness connotes an adjustment disorder causing dissonance or distorted perception in the persons suffering from it. In this illness, there are violent disturbances of the mood and great variation in the emotions and outlook of the person. Such is not the case with backwardness. Backwardness is essentially a mental or intellectual inadequacy and there has to be no confusion about it.

Definition of Backwardness

Backwardness has been defined variously by different authors and investigators. Some authors have classified the term in mental concepts and others have employed an altogether different approach in classifying and identifying the term. Some have emphasised intellectual inadequacies of the disability and others have highlighted the social and functional inadequacies. Dybwad⁴ has attributed backwardness to mental retardation. He has explained mental retardation as a condition which originates during the development period. He has explained it as a mental characteristic which is marked by subaverage intellectual functioning resulting to some degree in social inadequacy. Some writers have classified the term on causative considerations. The causative factors have been divided into two divisions; firstly, where the origin of backwardness is physical in nature and caused by the impairment of the nervous system; secondly, where the origin is environmental in nature and caused by the deprivation of social, economic, cultural and psychological factors.

Common classification of backwardness has also been done upon the degree of the defect. In this classification, the differences, are given quantitative meaning and, therefore, this approach emphasises

4. Dybwad, *Challenges in Mental Retardation*, Columbia University Press, London, 1964, p. 4.

the inadequacy in terms of degree rather than kind. Others have followed classification on the clinical pattern. In this classification, certain anatomical, physiognomical and pathological aspects have been taken into consideration. On the basis of the classification followed by the first type of writers, they have classified the level of backwardness into various degrees. In the identification and classification of backwardness, the degrees of impairment of the nervous system have been used as the basis of classification. The various categories are: Moron, imbecile and idiot. Others have used another classification viz., mildly retarded, moderately retarded and severely retarded. The aforesaid classifications have a physical or a biological bias in them. There are, however, other authors who have classified a backward person as one who is marginally independent, semi-independent and totally independent. This approach is simply functional in character.

On the basis of the second approach, intelligence tests have also been used in classifying various levels of backwardness. Many writers have attempted classification of the backwardness on the basis of intelligence quotient (I.Q.). Several important considerations have to be given, however, to this type of classification. The practice of use of intelligence quotient as criteria of classification has to take into account the nature of the standard tests. The standardized scores of a particular test may show marked variation in scores of persons from country to country. Due to many cultural, educational and other considerations, a particular level of score on intelligence test may include quite a few persons who are not really backward, but have scored low as they were not able to get opportunities to develop themselves fully. *Burt has defined backwardness on lines explained above and has defined a backward child as one who is unable to do work for the class next below that which is normal for his age. In terms of the definition, the term backward refers to educational attainment or acquired knowledge as related to chronological age.*

It is estimated that 5 per cent of the whole population (i.e., 25 per cent of the backward group), are not, however, of limited intelligence. The bulk of such types of pupils are simply under-achievers. They have also been classified as educationally retarded. There can be a group of slow-learners too. According to Schonell *backwardness* refers to educational age relative to Chronological Age whereas *retardation* refers to Educational Age relative to Mental Age.

Since specific terms like Educational Age, Chronological Age and Mental Age have been employed to understand the concept of backwardness, the location of the problem in India becomes due to the underestimation and overestimation of the chronological age of pupils. Without reliable data on the ages of pupils, the level of backwardness, becomes, evidently difficult to assess in India. With

this limitation in view, the concept of backwardness in India will suffer from many inadequacies.

Causes of Backwardness

There can be no simple causes of backwardness. Backwardness may be caused as much from physical factors, as from environmental factors. Dybwad, while throwing light on the causes of backwardness, states that not only have more than 90 causative factors been identified as operative in mental retardation but they have also frequently manifested themselves in combinations. Backwardness may be due to mental subnormality. Mental subnormality may be caused either due to biological factors which result in the impairment of the central nervous system or it may be due to environmental factors. The causative factors, in the environmental realms, could be social, economic, cultural and psychological.

From a biological angle, backwardness may be due to defective cerebral functioning caused by cerebral palsy. It is a neuromotor handicap resulting from cerebral disfunction and in many instances is associated with other handicaps such as those of vision and hearing. These handicaps create learning disabilities in speech, language, reading, writing and make the learning of school subjects difficult.

Due to individual needs and interests, causes of backwardness are attributed to different factors. Tredgold⁵ has attributed this deficiency to mental defect caused by inheritance. He also attributes backwardness to "adverse environment". Another author, Doll⁶ explains backwardness as endogenous and exogenous factors. The endogenous types are those who are diagnosed as mentally deficient caused by hereditary transmission of psychobiological insufficiency. The author classifies them as individuals who are organically and physically adequate but mentally inadequate. The exogenous types are those who have suffered from pathological alterations of normal development and from pathological morphology represented by the clinical varieties of mental deficiency. Another set of authors have also emphasised the biological aspect of the deficiency.

Kanner⁷ has also thrown light on the causation of backwardness by discussing the determinants of mental retardation. According to him, mental retardation, causing backwardness, may be due to varied causes such as, genetic, cultural, material, physical,

5. Tredgold, A.E., *A Text Book of Mental Deficiency*, 6th Ed., New York, William Wood & Company, 1937.
6. Doll, E.A., "The Essentials of an Inclusive Concept of Mental Deficiency", *American Journal of Mental Deficiency*, 46, No. 2, October 1941, pp. 214-19.
7. Kanner, Leo, *A Miniature Textbook of Feeble-mindedness*, *Child Care Monographs*, No. 1, New York Child Care Publication, 1949.

educational and emotional. The causes elaborated by Kanner are exhaustive and include in it the major causes given by others. Broadly, backwardness can be due to any of four causes such as brain injuries, physiological disturbances, hereditary factors or cultural influences or a combination of causes in various permutation and combinations. In understanding the etiological factors of backwardness, many large factors, varying from the biological domain have to be analysed.

On the basis of overwhelming evidence on the causes of backwardness it is evident that no cut-and-dried classification can be offered to explain this phenomenon. Backwardness may be due to many many causes and the interaction between these causes. A backward child may be suffering from specific disabilities of an innate and irremediable character of physical, mental, nervous or temperamental nature. Inadequate environment may influence his vitality and may blunt his effectiveness. Environmental factors like poor economic conditions at home may also produce backwardness. It has been found by many studies that poverty produces many mental and moral deprivations and these may lead to intellectual dullness. It may be, however, clarified that poverty in itself does not necessarily cause backwardness but may create conditions and susceptibilities which may facilitate the onset of backwardness. Intellectual deprivation and emotional disturbances at home may also contribute to backwardness.

Poor school conditions may also contribute to backwardness. Irregularity at school, constant migration from class to class, bad and ineffective methods of teaching may create such conditions as may be bad for a learner. The teacher's attitudes may also generate anxiety and fear in pupils which may retard learning and create maladjustment among them. Other factors like unhygienic conditions in school may also affect the development and training of pupils and this may retard their normal progress in schools.

Certain personality variables may also induce retardation and backwardness among pupils. Burt maintained that developmental history of pupils can be severely thwarted by physical, intellectual, emotional and moral characteristics. He maintains that physical and mental retardation may be the double expression of an inborn or inherited lack of vitality. Physical deformities, pathological bodily conditions and defects of sight, hearing and speech may create many problems in him which may handicap him to learn. Similarly, mental deprivation, emotional shocks and lack of moral standards may be also responsible for the backwardness. Quoting figures of his studies on the causes of backwardness, Burt states that 20 per cent of his backward cases came from poverty-stricken families. In 8 per cent the child's health and vigour were gravely impaired by the material conditions of his life at home; in 16 per cent his education was seriously hampered by his low intellectual conditions;

emotional and moral trouble were noted in 11 per cent; and in 3 per cent the condition of the neighbourhood seemed inimical.⁸

Development Pattern and Backwardness

The pattern of development in backward children may be varied and different, depending on the combination of many hereditary and environmental factors. The type of backwardness would depend on the inadequacies and handicaps from which the backward child is suffering.

The pattern of development in backward children is varied and different, depending on a number of hereditary and environmental factors and on the consequent interaction between the two. Since backward children suffer from mental, physical, moral and emotional inadequacies, their development in these areas are affected. These discrepancies in the growth and development of backward children may create many problems for special education.

The pattern of growth and development in backward children are determined by the individual differences and the specific characteristics of hereditary and environment of the affected person. Among them, mental inadequacy is the first characteristic of their development. Backward children represent the lower groups on the intelligence scale, if backwardness is due to mental retardation or mental deficiency. They may have normal hearing and vision or they may be suffering from the defects of audition and sight. Auditory handicapped children may be totally deaf or only hard of hearing. They may have been born deaf or they may have acquired deafness after hearing language and speech. Consequently, these defects may affect their all-round achievement. Visually handicapped children may also have defects of vision which may be corrected either through medical treatment of optical aids or both. These visually handicapped children, after correction and treatment, may become normal for purposes of school education. But defects of vision can also be beyond correction which may create training and instructional problems.

Another discrepancy in growth and development may be in the direction of speech. Speech being the main power of communication and socialization, its defects may also retard the mental and social growth of the person and affect his education.

To understand the complex development pattern among backward children, the anatomy and physiology of their nervous system has to be understood. As one of the important factors, the defects and functioning of the nervous system is a focal-point in the framework of backwardness. The nervous system, as an anatomical system, is the director and coordinator of all bodily systems. This

8. Burt, S.C., *The Backward Child*, University of London Press Ltd., London, 1915, p. 133.

being so, disorders in the nervous system can produce sensory and physical disorders which may be a contributory cause towards backwardness. The deviation in abilities and aptitudes may develop a lesser range of intellectual interests and socio-cultural development. The development profiles of backward children represent the typical characteristics of their deficiencies in their mental, emotional, physical, social and other directions.

Cerebral palsy and associated disorders also affect the developmental pattern of children which contribute to their backwardness. Cerebral palsy and associated disorders may result in cerebral dysfunction and disabilities creating the disorders of speed, perception, handedness and vision. All the aforesaid defects may be responsible for the learning disabilities and may delay or retard the learning process. It may also create neuromotor handicaps which become a problem of neurological concern.

As a developmental mechanism, the relationship between body and mind has to be interrelated. Many studies have shown so. Orthopaedic impairments, which are likely to interfere with the normal functioning of bones, muscles or joints, can also cause backwardness. Mind, mental retardation and physical impairment contribute to the development of backwardness as cognitive functions are related to development and growth. As growth goes on, the abilities also increase and as the maturity increases, cognitive skills also mature. Intellect is a correlate of organic growth, and physical growth and intellectual growth are related to each other. This interrelated influence of body and mind and vice-versa, which refers to the monists point of view is against the dualistic approach which does not believe in body-mind relationship.

Basic somatic components of mental retardation and backwardness have been studied and identified by many authors. One of the foci of these studies has been the relationship of biological correlation to behavioural deficit. In this are included the disorders of structure, body chemistry and metabolism. The results of many studies prove that developmental history of backward children is full of deprivation and impairments of all sorts. Beginning with Goldstein's work and continuing through several volumes of Strauss and his associates, it has become clear that disturbances of motor and cognitive processes are the results of implied disabilities of the brain which affect subsequently the development status. In a way, bodily defects and minor physical ailments are to a considerable extent found among backward children. These ailments ultimately retard the development process and subsequently hamper his education. Well defined stages of gross mal-development may result in many physical defects accompanied by malfunctioning of the body. The pathology of bodily ailments may result in defects of sight and hearing. It may bring speech defects or may cause left-handedness.

The physical and mental defects as a result of bad development

may also cause emotional and moral disorders which become a part of developmental history. Temperamental history may develop as a result of bad physical and mental growth. In short, the developmental pattern and growth of the individual are related closely to the problem of backwardness.

Backwardness as a Social and Psychological Problem

Among many problems, backwardness produces problems of great social and psychological magnitude. Backward children suffer from inadequacies of growth and as a result of this they may develop many psychological complexes. A detailed explanation on social and psychological problems, created by backwardness are warranted.

Socialisation is an important process and involves many basic and fundamental elements in its formation. By and large, socialisation comes from the interaction of organic and environmental factors. Persons who are equipped with a healthy organic constitution and with a healthy nervous system and who are given such emotional experiences as are conducive to their growth, will have effective socialisation. The genesis of social functioning and character-formation, are important in the development of character and personality. Social differentiation is an actual process which involves participation of many physical and psychological functions. Socialisation is a dynamic process and involves different levels of social maturity. The importance of each social level is of great significance as it relates to various degrees of social maturity.

In a backward child, this process of socialisation becomes difficult. He does not have a healthy equipment in the form of organic brain power. Due to inadequate socialisation, a backward child suffers from many physical and character disorders, from social prejudices and attitudes and from innate dislikes and likes. They produce abnormal social functioning in him. In a social situation he shows attitudes and adjustment patterns which are not mature enough for the society. He is unable to undertake complex social roles. Since socialisation is the development of social roles, he is unable to build up correlation and mental perspective which are essential for social growth. His immature social actions are the result of his immature social growth. One of the values of socialisation is the opportunity for the child to understand his role. But a backward child does not have normally developed mental faculties to help him in the crystallisation of socially adjustive habits. This creates special problems of character also in him. The level of mental ability is not sufficient to help him in socialisation.

Backwardness is also a psychological problem of great magnitude. Backward children suffer from many inferiorities and personal deficiencies. Backwardness, in the first instance, reduces the

social and mental competence and brings a lack of interpersonal relationship.

Social intelligence and mental competence are essential components for maintaining social relations. Lacking in mental maturity and unable to place them effectively in a competitive group, backward pupils become conscious of their deficiencies and are unable to make a mark as helpful and contributive individuals in the group. Comprehensive studies on backward children have shown that they present problems of diverse nature to parents, teachers and to themselves. Their activities were found to be severely retarded and their behaviour mostly passive or inactive. They were found to pursue a pattern of activities similar to those suffering from mental and social deficiencies. Due to deficiencies of social, mental, emotional and moral nature, backward children are full of complexes and problems. Their backwardness creates many problems, for themselves and for their parents.

Psychodiagnostics and Backwardness

The discovery and diagnosis of backwardness is necessary for the treatment of the malady. For discovery and diagnosis it is necessary that counsellors, teachers or parents should have a sound knowledge of the etiology of backwardness. Without sound knowledge of etiology, the diagnosis can be wrong and the treatment given irrelevant to the problem. A therapist should have thorough understanding of the right methods of observation and analysis on backward children. The singular peculiarities of conduct and action have been observed carefully and objectively among backward children and the observations and prognosis have to be done properly. Hasty interpretation is bound to bring misunderstanding. For diagnosis, knowledge and insight into the etiology of the problem have to be gained first.

Psychodiagnosis on backwardness is not easy as backwardness is not simply an intellectual deficiency, but is also a condition where achievement is prevented by a variety of interacting influences. In psychodiagnosis, the part played by personality maladjustment, emotional attitude, environmental conditions, physical disabilities etc., have to be appropriately evaluated.

The function of diagnosis is to discover the nature of backwardness and for this long observation is essential. Snapshot observation will provide only limited information. An effective diagnosis entails objective standards of judgment. In many cases where observations are poor, judgments on the alleged dullness of children and its causes are made on too narrow a basis or on mere personal impressions. This is by all means, not sufficient for effective judgment. Observations on the etiology should cover a wide area of personality, intelligence and educational attainments. For this, standard tests will have to be employed and the testing done over a

long period of time and on varieties of abilities. The levels of analysis have to be thorough. Although there is the inherent difficulty of differential diagnosis, psychometric methods and considerations are the main sources through which the psycho-diagnosis is possible. The way in which psychometric methods can be possibly employed for diagnosis and evaluation of backwardness are given below.

Intelligence Tests and their Use in Psychodiagnosis

The use of intelligence tests, verbal and non-verbal, group and individual, in diagnosis is much. They provide objective standards and evaluate the general powers of backward children in mental fields. The proper use of the intelligence tests of any kind require a thorough knowledge of testing technique and of the principles underlying it. Many observations from intelligence tests are necessary in order to get a true picture of the mental capacities of backward children.

The application of scholastic tests is also necessary to evaluate the deficiencies in arithmetic, reading, spelling, composition, writing, and comprehension. They can throw light on the school attainment of the prospective cases of specific backwardness. With the help of the scholastic tests, general and specific problems can be differentiated and causes of disabilities and handicaps properly evaluated.

Other psychometric tests, which are of sensory nature can also be employed for diagnostic purposes. The function of the diagnostic tests is to appraise, evaluate and analyse the specific skills acquired by backward children. A diagnostic test has essentially to disclose the exact nature of the errors made by the backward children. Similarly, tests of hearing and emotional characteristics can also be effective in psychodiagnosis.

Treatment of Backward Children

Treatment of backwardness is possible only if the conditions in the environment have been so bad as to have hindered the maturation of the child. Cure or treatment is not possible if the child has no potentialities to grow. Since unfavourable conditions in the environment are not conducive to normal development, faulty conditions at home result in the frustration of a child and this brings, in turn, many insurmountable handicaps. Parental neglect is also detrimental to the development of the child. The possibilities of prevention are there only if the backwardness is due to a lack of proper stimulation of the child.

The treatment of backwardness is essentially a problem for the schools. Some of the steps that can be adopted by schools in the treatment of backwardness are to gear up school organisation, to

refine the curriculum, to modify the methods of instruction and to introduce varieties of school activities which would be helpful to the child for his education and development. A school should provide a reasonable free and healthy atmosphere, a variety of approaches to the various subjects and a suitable elasticity of organisation.

The schools should also recognise the individual differences among pupils and respect the individuality of the child through a helpful environment and an invigorating school regime.

Backwardness in the child may assume many forms and among them, reading disability, spelling difficulty or writing disability may be some. The treatment of these disabilities can be done through remedial teaching. In medieval teaching, a pupil suffering from backwardness has to be given individual attention. The teacher has to be sympathetic and kind towards the pupil and he must teach the lesson at a concrete level. For doing this, he has to employ concrete material as teaching aids and has to teach through special methods dictated by the nature of backwardness in the child.

Many investigators have done considerable work on devising special methods of teaching for the backward children. In this connection, the works of Fernald and Kellers, Crates and Monroe, are of special importance. In these methods, the teaching is done at a practical and concrete level. Backwardness in reading is treated by memory reading which arouses confidence, introducing works connected with a topic of interest and measurable practice on visual and phonic units. Similarly, special methods of teaching spellings have also been introduced.

Treatment of backwardness also involves therapeutic considerations. The various types of therapies that can be employed for the treatment of backwardness are functional therapy, psychotherapy, surgical therapy and chemotherapies. In the functional therapies, an effort is made to change intellectually and personally and to effect a change in behaviour in a desirable direction. Through functional therapies, an attempt is made to raise abilities in children by means of certain kinds of interpersonal interaction and by the use of certain kinds of tasks which are roughly instructional within the given level of abilities with which a given individual is endowed. Accordingly, certain limitations are imposed on the training method. However, it can be said that directed experiences can help the retarded. If the expectations are not radical and if the programme is usefully developed, progress and growth can be anticipated in selected cases.

Psychotherapy is another method of treatment for backwardness. Psychotherapy has many forms. Through this method, the backward person is to act only by talking things or with an accepting

listener. There is the deliberate interaction of two persons working at the resolution of problems and the development of insight. The interaction can also take place between a group consisting of more than two persons. Therapies seem to be accompanied by certain changes brought forth by catharsis, transfer, learning and acceptance. To a backward child, psychotherapy enables him to adjust himself to the special class or to the whole school. He is also made to gain perception of the self and to learn community living and institutional living. Various studies have shown that psychotherapy for the backward has produced a positive change in the level and manner of behaviour.

Surgical therapies have also been employed to treat certain types of backward children. Surgical therapies are drastic methods and are employed to improve the functioning of the body. Through some operation—major or minor—some structural changes are brought about in the body with the purpose of making the bodily functions ineffective in certain directions. On the whole, the effect of therapy is to introduce higher levels of physical and psychological functioning. The use of physical intervention of a gross manipulative nature can take many forms.

Other assorted techniques are also employed to bring relief to the backward and retarded. In this, drugs, sterilisation, etc., are employed in bringing a change in the behaviour of the person who is backward and retarded.

Educational Policy for the Backward

Educational policy for the backward children should be guided by special considerations arising out of their disabilities. Education for backward children should aim at developing necessary skills so as to enable them to lead a life of usefulness to others and of self-support for themselves. Education for them should be selective and should aim at developing necessary skills, attitudes and interests in them. The level of their difficulty of their lessons should be graded to their degree of backwardness and should be phased in accordance with their limitations. Although backward children may be suffering from illness and intellectual retardation, an opportunity should be given to them to mix with bright children so that they share the wide pursuits and social skills of bright children.

Since backwardness can also be connected with poor reading, spelling, speaking and writing the educational curriculum of the backward children has to keep these considerations in view. There has been considerable discussion and controversy on segregation and integration and on manual curricula and academic curricula for backward children. Whatever may be the merits of such controversy, the content of the curriculum has to be of such level that backward children should not fail to profit from instructions. The contents of the curriculum and the goals of instructions should

aim at training the backward children to a certain level of schooling through the exploitation of their manual skills and senses training. It is an undisputed fact that a vast majority of the backward children are potential learners whose learning cannot be confined to purely manual skills and sense training. Under a suitable level of motivation and readiness, a number of skills can be picked up by them which can enable them to be economically and socially independent.

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THEORIES OF FREUD, ADLER AND JUNG AND THEIR EDUCATIONAL IMPLICATIONS

Sigmund Freud

SIGMUND Freud is the founder and the principal exponent of Psychoanalysis.¹ Psychoanalysis is one of the schools of abnormal psychology investigating the causes of mental disorders and treatment thereof. It also throws light on various problems of general, social, child and educational psychology. Freud called it 'depth psychology' also for it diagnoses mental disorders. Psychoanalysis probes deep into the recesses of the unconscious mind. Psychoanalysis is primarily a science of mental abnormalities. It has also an interpretation of dreams and treatments of every day errors. Psychoanalysis helps us in understanding mental disorders.

THREE LEVELS OF MIND

Psychoanalysis has discovered three levels of mind: (i) conscious; (ii) pre-conscious; and (iii) unconscious. Traditionally there were only two levels of mind i.e., conscious and the pre-conscious but Freud was the first person to increase it to three.

Conscious

In conscious level of the mind individual focuses his consciousness on a particular thing, for example, as you are studying this book, the portion which you read at the moment is the centre or focus of your conscious field.

Pre-conscious

In pre-conscious we have vague consciousness of objects or the persons experienced in the past, forgotten altogether and recognised or known afterwards. The pre-conscious of memories can be recalled with some difficulty.

1. Freud, S., *An Outline of Psycho-Analysis*, New York, W.W. Norton & Co., Inc., 1949.

Unconscious

Outside the field of consciousness, yet within the field of mind, there exists the deepest level, viz., the unconscious. It is not conscious and so it falls outside the sphere of consciousness and yet it falls within the field of mind.

According to Freud unconscious mental states go back to early infancy. Desire, the fulfilment of which is considered by authorities like the parents, teachers, nurses, family, society and the state is immoral, are repressed by the child and banished to the unconscious for fear of punishment. Desires are however, dynamic in nature. So they strive to find a way out to the conscious mind. They fail to manifest themselves fully in waking life, to elude the vigil of the super-ego or punishing conscience and avoid punishment. So they appear in the guise of every day mistakes of waking life of dreams in sleep and of symptoms in mental diseases. These manifestations distort the true contents of the unconscious mind. Psychoanalysis attempts to lay bare the latent desires motivating these manifest contents.

Repressed desires form the contents of the unconscious. Normally, the individual has no consciousness of these, nor can he bring them to the conscious by his voluntary efforts. They can be translated in terms of the conscious only by the method of free association as applied by an expert psychoanalyst.

EVIDENCE OF UNCONSCIOUS MIND

Errors of everyday life, dreams, mental diseases, hypnotism suggestion, among other phenomena, are incontrovertible evidence of the unconscious.¹ Besides, all the higher values of the psyche like art, morality, religion, literature, social customs and manners, rites and rituals of different religious institutions and myths are motivated by the forces of unconscious.

In his *Psychology of Everyday Life*, Freud made valuable contribution to the understanding of the common errors which we make. Everyday mistakes do not occur by chance, but by causative forces of the unconscious. The forgetting of proper names or of one's intention, various lapses of memory like slips of tongue, pen, or in reading, wrong seeing and hearing among other errors of everyday life like mislaying objects, are caused by repressed desires of the unconscious. Dr Brill cites an example of forgetting a name. A colleague of his, Dr B. failed to remember the name of his relative Mr Brown, though he happened to have been indebted to the latter in various ways. Mr Brown had written to him, waiting

2. The entire discussion of evidence of unconscious is based on the views of Freud in his book *Psychopathology of Everyday* (1904), N.Y., New American Library, 1951, and *Collected Papers*, Vols. I-V, London, Hogarth, 1925-1950.

some money as loan a month and half ago. But far from sending him money, Dr B. not merely made no response to that letter, he managed to miss it altogether. The forgetting of this name was caused by B's conflict of the sense of gratitude with his refusal to extend him any help. It was simply motivated by the unconscious desire to get away from this unpleasant situation.

Daydream is another evidence on the point. The daydreams of the cow-girl, the egg-seller illustrate the workings of the unconscious. Each of them dreamt while awake so that he or she would be rich from the sale proceeds of his or her commodity, so that the princess or the prince of the country would approach him or her for marriage, whom he or she would refuse by nodding or kicking. Each physically nodded dissent or kicked resulting in the destruction of the goods. At the root of such daydreams lies the unconscious repression of their desire for self-assertion in waking life.

Dreams are also motivated by some repressed desire of the unconscious. Immoral and anti-social desire being opposed to accepted ideals of life find no fulfilment in waking life. So they are driven to the unconscious, being repressed. But they constantly persist in coming out from the unconscious to the broad daylight of the conscious. When in the state of mild sleep, the vigil of the super-ego is relaxed, they manifest themselves in the conscious in disguise. Dream means such distorted manifestations of unconscious desires in the conscious during the state of mild sleep.

The phenomena of phynotism and suggestions, again, lend confirmation to the existence of the unconscious. An individual carries out suggestions given to him during the hypnotic state even after it is over, when such suggestions are forgotten. Thus post-hypnotic suggestions seem to be motivated by the unconscious. It may, however, be remarked that the hypnotic state may be a sub-conscious or vaguely conscious, instead of an unconscious one, for the hypnotised person does not carry out orders in the post-hypnotic state, if these are opposed to his moral or spiritual nature.

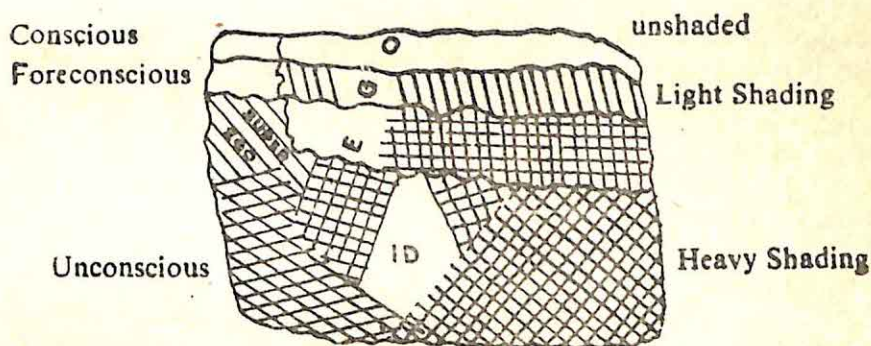
Unconscious desires are, again, manifested through various disease symptoms. Washing mania, a case of obsessional psychoneurosis, may be cited as an example. The washing maniac fears lest he is defiled by touch. Under the pretext of keeping his body pure, he goes on washing himself, bathing and rinsing or washing his mouth for hours together. Again, the counting maniac goes on counting some objects lest some mistakes in counting might have crept in. Behind such disease symptoms are operative some or other forbidden and so unconscious desires. The fear maniac, again, is afraid of everything due to some immoral desire repressed in infancy and so banished in the unconscious. Similarly, hysteria, paranoia, melancholia and dementia praecox, among other mental diseases are motivated by repressed unconscious desires.

Threefold Division of Mind

Another threefold division of mind is into the Id, the Ego and the Super-Ego. The Id is the unconscious reservoir of instinctual urges. Sexual or erotic desires adverse to our education and culture, so repressed and banished to the unconscious are collectively called by Freud the Id. The Id is blind and irrational and is positively seeking their conscious manifestation. It is ruled by the pleasure principle. The second division of the mind, called the Ego, which is conscious and unconscious also is a part of Id itself, is mainly self-preservative and self-assertive in its tendency. It is through the Ego, that the Id finds an outlet. The third division variously called conscience, censor, super-ego and ego-ideal, represents the 'introjection' into the Ego of the external and moral authorities, specially, the parents. It is deeply rooted in the unconscious. Its main function lies in curbing the blind wishes of the Id and also in subduing the unlimited desire of the Ego towards self-expansion. The poor Ego, as Freud says, has to serve three harsh masters viz., the external world, the super-ego and the Id.

Topographical Explanation of Mind*

Contact with Outside Region



Freud's Classification of the Psycho-sexual Stages

Freud's classification of the psycho-sexual stages of development of the child which correspond to changes in personality, is as follows: The child at first derives pleasure from the stimulation of its oral orifice through sucking at the oral-erotic stage. It is in the beginning passive or masochistic for at this stage the child wants to retain the Mother's nipple in his mouth. Now the child's life is like that of the parasite, when he remains inert, dependent and optimistic. At the next stage the child's passive anal-erotism becomes active or sadistic. Now the child is aggressive in not merely

* Redrawn from: *The Structure and Meaning of Psychoanalysis* by Healy and Bronner.

retaining the mother's nipple in its mouth but in biting it and entertaining an attitude of jealousy, ridicule and despair in relation to the mother. The second stage of the child's psycho-sexual development is Anal-erotic. In it the centre from which the child derives pleasure shifts from the mouth to the anus. Here the child is at first active and later on passive. In the first the child derives pleasure from the contraction and the expansion of the anus and in the other it has it from the anus and faeces themselves. Mentally the child at this stage grows awkward, obstinate, egotist and opportunist. At the third stage of its psycho-sexual development, the child becomes genital erotic, which at first is Phallic and then Genital. The first is relatively vague and homogeneous in which the child thinks all individuals as possessed of the penis and drives sexual pleasure from the mouth, the anus and all parts of the body. So the child at this stage is called 'polymorphously perverse'. The Genital phase is the normal stage of psychosexual development, in which the genital organ becomes the centre of sexual pleasure. At this stage the child is creative, adaptive, dependable and cooperative.

Dynamic Nature of Psychoanalysis

Psychoanalysis is dynamic and voluntaristic. All activities of the mind are, according to it, motivated by unconscious desires. These are opposite and opposite wishes are conflicting in character. The intra-psychical conflict of opposite desires leads to repression, which forms the basis of the unconscious. Repressed desires struggle to find an outlet through conscious manifestations. They are mainly sexual and erotic in nature. So the super-ego resists them. To escape its censure, unconscious wishes disguise or distort themselves and are indirectly gratified. Thus are formed the various symptoms of mental disorders, the manifestations in dreams and the common errors of everyday life like forgetting a proper name or mislaying an object.

The devices or mechanisms adopted by the unconscious for conscious manifestation are sublimation, replacement and reaction formation. Sublimation, as Stoddart says, is the diversion of an unconscious wish into useful, social, moral or ethical directions. For example, the maternal complex may be diverted into attendance at a creche, interest in societies of infant welfare, or taking up the nursing or teaching profession. Replacement does not subserve any useful function like sublimation. For example, repressed maternal instinct may be displaced in an interest in dolls. In reaction formation, conscious activities are the very contrary of the unconscious desires. For example, persons, who have repressed a desire to steal, may become scrupulously honest.

Psychoanalysis means laying bare or unravelling the unconscious

desires motivating disease, symptoms, dreams and everyday mistakes. The method adopted by it for this purpose is free association, not hypnosis as practised by Charcot for the latter leads only to temporary relief or cure. In free association, the patient lies down in an easy chair comfortably, relaxs all control of his mind, lets it drift along the trains of free images or ideas that occur in his mind and talk these out without inhibition or resistance. The points where he gets stuck are crucial, for they hide complexes, which lie at the root of all mental troubles. The patient is then asked to make free association of these complexes again and again, till their complete purgation or catharsis occurs, resulting in the relief from or cure of his disease. This talking-out method as practised by Freud, differs from that of Breuer in which while the latter gives it up halfway, at the stage of transference, Freud follows it up to its successful culmination in re-education to reality. As analysis continues, forgotten episodes of the past or even infantile life of the patient are revived in the conscious. Repressed unconscious desires come back charged with their associated feeling and emotion. The revived oedipus situation substitutes the analyst for the patient's father. So the analyst becomes his love object, on whom are transferred his love and hatred due to the parents. When the final stage of transference occurs, the analyst is the master of the whole situation. He now redirects the pent-up desires of the patient to normal or healthy channels. This re-education to reality gives the final touch to psychoanalysis taking the patient back to normal life.

The infant, according to Freud, is 'polymorphously perverse', with his libido or sex energy excited by the stimulation of various organs. At first, he gains satisfaction, from the mouth in sucking, or he is oral-erotic. At the next stage, he derives pleasure from the anus in defecation, or he is anal-erotic. Only in the final stage does he get pleasure from the stimulation of the genital organ, that is to say, he is phallic or genital-erotic. In the first two stages he is homosexual, while in the last alone he is heterosexual.

The infant is masochistic, or sadistic, according as he derives pleasure from tormenting himself or his love-object. He is, again, narcissistic or auto-erotic and allo-erotic, according as he loves himself or others as well. He finds himself at a point in the oedipus triangle, the other two points being occupied by his father and mother. He develops love towards the parent of the opposite sex and hatred towards the one of the same sex. The former he wants to usurp and the latter to destroy. The oedipus desire, therefore, is ambivalent and it is repressed or adjusted to by the time the infant is five. His further development depends upon whether he has dealt with it effectively or not.

Educational Implications

Conscious mind is only one-tenth of the mind and unconscious

mind is nine-tenths of it. Knowledge of the unconscious mind is a must for the teacher. Teacher cannot be an effective teacher until and unless he has thorough knowledge of the unconscious mind. He must understand that child has repressed desires and it is his duty to sublimate various defence mechanisms. The teacher, as such, must understand that the mechanisms adopted by the unconscious mind for conscious manifestation are sublimated. The teacher can divert the maternal complex into attendance at creche, interest in societies, for individuals, welfare or taking up nursing or teaching profession.

The teacher must also understand the Id-Ego and Super-Ego. The teacher must redirect the pent-up desires of his pupils to normal or healthy channels. Thus education to reality is a fundamental knowledge which teacher is supposed to know.

Psychoanalysis has changed the conception of education and widened its aim. The aim of education is no longer the formal training of the intellect. The psychoanalysts have widened this aim by including in it the development of the whole of personality for socially desirable purposes. Each individual is to be helped to make the best of his life so that he may live as a useful member of the society.

Psychoanalysis has laid stress on certain psychological incentives in education which have been recognised by all progressive educationists all the world over. These means are particularly necessary for early education. These are: (a) affection or the policy of preserving the child's emotional tie to his parents and substitutes. This is also recognised by such great educators as Pestalozzi and Froebel; (b) use of instincts, their utilisation in various activities; (c) permissiveness and leniency; (d) the child's own will or interest which is the educator's most powerful ally. Unless the child's will is activated, education can never succeed, (e) Positive incentives instead of negative ones, rewards rather than punishments—positive incentives will be associated with the child's own insight, critical abilities etc. The child's insight is as much a means of education as his mother's rewarding smile. At each age level, a humanised education makes the fullest use of the child's critical abilities.

Psychoanalysis has thrown light on and explained the variations that we find in the assimilation of various subjects among different children. Our experience tells us that the degree of assimilation not only differs from person to person but even from subject to subject. We ascribe these variations to differences in intellectual capacities or deficiencies. Psychoanalysis tells us that the fact of variation is far more a question of affective inhibition versus sublimation, thus depending on the child's reaction to the unconscious association of the subject-matter. What happens is that every part of the conscious topic becomes associated with unconscious ideas. It can even symbolise these. Researches have shown how in certain cases errors

in computation may be traced to such factors as a queer half-conscious preference for certain figures and dislike of others because the latter symbolise unpleasant things. Schonell's researches in the diagnosis of specific backwardness bear out this fact. Blanchard's work in the problems of reading disabilities shows that in many a case the emotional conflicts and difficulties in personality development cause this disability. These emotional conflicts arise out of the disturbance in parent-child relationship. The result is that the child has to use so much of his energy for maintaining repression that very little is left for such a complex mental process as learning to read.

It has been explained why the act of teaching and of imparting information is sometimes resisted by the child in spite of his natural thirst for knowledge. This resistance, in extreme cases takes the shape of disobedience and refusal to cooperate with the teacher. There may be environmental conditions that are unfavourable to learning. The act of teaching is performed in such a way that it implies the child's self-respect and stimulates his aggression: hence the opposition. The child remains a bad learner in spite of his abilities. This situation improves if the act of teaching becomes a cooperative activity.

Psychoanalysis brings out the importance of proper environment for the education of children. The environment in the school and in the home should be such as to reduce the chances of repression and increase the chances of sublimation. It has brought out the significance of play in the education of children. It is an activity which brings to the child psychic equilibrium in the early years by enabling him to express his attitudes, wishes and impulses, and phantasies. Psychoanalysis like Melanie Klein have developed play-therapy and play-techniques for the treatment and analysis of young problem children. It has given impetus to such movements as "Child Guidance", "Mental Hygiene" and "Freedom of the Child" movement. The psychoanalytic study of young children emphasises the importance of respecting the child's individuality at an early age. The personality of the child and of the adult that he is to be, rests in the last resort on the inner-flux of forces within his own mind.

Psychoanalysis has brought to the forefront the very early years of the child for proper study and care. Most of the maladjustment among pupils can be traced to some incidents of early childhood. Many of the child's classroom difficulties are the surface manifestations of a deep-rooted problem which has its origin in his pre-school experiences. Assuming that early childhood is the most critical period in the development of personality. Equipped with proper parental education which should include knowledge of nutrition of the child, emotional training, sex education, habit-training and

child care, parents can help in the growth of well-balanced personalities with mentally healthy attitudes towards life. Parents need to develop tolerance for childish difficulties and misdemeanours and patience in dealing with them.

Freud has shown that the young child is by no means a creature of mere wish or impulse. He has already within his own psyche powerful controlling and inhibiting tendencies. The parent and teacher should help build a strong and healthy super-ego. This can be achieved through positive guidance and not through exasperated threats, whippings, etc.

The psychoanalytical theory has changed and affected the problem of evaluation of standards of behaviour. For example, we are led to recognise the fact of infantile sexuality. We are made to tolerate some amount of open sexual behaviour such as masturbations, exhibitionism, rude talk about the excretory processes as found in the early childhood in the nursery schools. We no longer regard children as abnormal for the display of such behaviour. Indirectly we have been warned that when sexual behaviour becomes flagrant and exaggerated, children may need special psychological help in the form of some pursuits in non-sexual directions.

Problem children present a serious problem to a conscientious teacher. There are children who are obdurate or destructive; there are children who are aggressive, who steal and tell lies and who play the truant. There are others who withdraw into themselves, are unsocial and shy. Destructive and aggressive children may be giving expression to their hatred of the parent or parent-substitute. Phobias and dislikes may be the result of transference and displacement. Psychoanalysis helps us by making us understand the unconscious motives behind delinquency.

Not only have psychoanalysts emphasised the importance of emotions in the life and education of children, they have thrown glowing light on the problems of emotional development from infancy to adulthood. This knowledge enables parents and teachers to adopt the right attitude to children when at home or in school.

Thus, we see that the teacher can help the pupils a great deal if he knows the theory of psychoanalysis. The knowledge of psychoanalysis enables the teacher to understand the child better. "The content of the unconscious is an essential part of the pupil's nature, and must be known in a general way, if the pupil is to be intelligently handled." A knowledge of this method and its underlying principles can give a teacher the required knowledge and skill for obtaining the best educational results.

Adler

Adler's psychology is also known as Individual Psychology.⁴

4. Woodworth, R.S., *Contemporary School of Psychology*.

In 1912 Alfred Adler and C.G. Jung, two great collaborators of Freud, broke away from him and founded schools of their own, known respectively as Individual Psychology and Analytical Psychology. They agree with each other to differ from Freud in attributing less importance to sex. But they also differ from each other as widely as they do in common from Freud himself.

Adler regards ego, rather than libido as the motive force of normal and abnormal behaviour. He lays more emphasis on individual differences and differences in environment than Freud does. The child is born inferior to the grown-ups. This sense of inferiority spurs him on to acquire superiority over others. Will for power or an urge for dominance and superiority is the dominating force motivating all conduct. Man is driven to seek compensation for inferiority and is led often to overshoot the mark. Demosthenes, who was a stutterer, not only overcame stuttering but became a great orator. Such masculine protest against inferiority is the motive force of behaviour. So according to Adler the self-assertion rather than the sexual impulse, is the major drive. Normal or abnormal life depends on how this drive is satisfied.

This infant's individual drive for power is opposed by the native capacity for friendly and loving response to friendliness and love shown by others. The proper cooperative spirit develops in him according to how he is treated by his mother in the first few years. A pampered child fails to develop along normal lines. The entire family situation in which the child finds himself, stimulates him to develop a certain 'style of life', as Adler calls it, or a definite attitude towards life. The pampered child, for example, is a spoilt child who wants to command and not to obey and who expects to have his work done by others. Thus Adler, like Freud, though in a manner unlike that of the latter, lays great stress on the family situation in which the infant finds himself, as determining his character.

Sex-life, according to Adler, is only a part of the individual's total style of life. The three typical problems of life are community living, occupation and sexual love. Of these the first is of primary importance, while the other two fit in with the first. Neurosis, according to Adler, is due to the lack of proper balance between the individual's style of life and social life, leading him to substitute fictitious or pretended superiority for actual inferiority, or to evade the difficulties of life instead of facing and conquering them.

Not only the individual's family situation or social position and occupation, but also his manner of standing, walking and sitting and lying down, may reveal the style of his life. For example, a man sleeping upon the back wishes to appear as great as possible. Again, a man lying down curled up like a hedgehog, cannot be of a striving and courageous character. A person sleeping on his

stomach is stubborn and negative. Adler is fond of making generalisations of this kind.

Freud regards dream as a fulfilment of old wishes or he explains them with reference to the past history of the dreamer. Adler, on the other hand, explains dreams with reference to the dreamer's emotional attitude towards his present problems. Dream is, according to him, a rehearsal of how he would like to face an actual problem of his present life. A man with a suspicious and hesitant style of life and about to be married may dream of being halted at the boundary between two countries and threatened with imprisonment. As a method of dream analysis, Adler prefers a direct conversational approach to the dreamers and the interpretation of the dream as a whole to the free association of the dream. It is a whole rather than a part method of treatment that Adler prescribes.

Educational Implications

Adler laid more emphasis on individual differences and differences in environment. This is a useful point for the teacher. Adler said that infant's drive for power is opposed by his native capacity for friendly and loving response to friendliness and love shown by others. Adler said that the proper cooperative spirit develops in him, according to how he is treated by his mother in the first five years. In other words, Adler believed that a pampered child fails to develop along normal lines. This has an educational implication for the teacher. The teacher must also understand that the family situation in which the infant finds himself determines his character.

Again, the concept of inferiority complex is a useful concept for the teacher.

Jung

Jung's psychology is known as analytical psychology.⁵ Jung extended many of the psychoanalytical concepts. The 'libido' for example, meaning in psychoanalysis the sum total of the 'component instincts' entering into the sexual urge, means in the analytical psychology of Jung, the total vital energy like Begson's 'elan vital' and Schopenhauer's 'will to live'. Jung's 'libido' finds its outlets in growth, in reproduction and in all kinds of activity. The unconscious of psychoanalysis, again, is extended also to include along with it a deeper level of mind common to the whole race or the 'collective unconscious' containing the 'archetypes' that express the primitive concepts, needs and aspirations of humanity. Freud reveals the predisposing cause of neurosis by tracing it back to infantile oedipus complex, while Jung adds to it its 'exacting cause', which

5. *ibid.*

consists in the individual's lack of psychic energy, as Janet also holds, adequate for solving present problems of life. Failing to solve his present problems by his adult way of life the individual regresses to the fantasy world of his childhood. As Jung says, "I no longer find the cause of neurosis in the past but in the present." Freud's polarity of a death instinct and of Eros is not accepted by Jung. Yet he recognises several polarities like those of introversion and extroversion, on the one hand, and of the conscious and the unconscious, on the other. In introversion the libido has an inward thrust, while in extroversion it has an outward thrust. The second polarity is that between the conscious and the unconscious already referred to. Deeper than the personal unconscious lies the collective unconscious.

Dream-analysis for Jung consists in interpreting the archetypes that crop up in dreams. The personal unconscious is to be investigated, in the first instance, to be followed by laying bare the collective unconscious. Dreams indicate not merely disturbing complexes of the past, but also constructive stirrings of the unconscious, looking towards the future. Dream, as it is differently analysed by Freud, Adler and Jung, is illustrated by one, reported by a young man, who, having finished his education failed to select an occupation and became a neurotic. The dream is as follows: "I was going up a flight of stairs with my mother and sister. When we reached the top, I was told that my sister was soon to have a child." Freud would interpret this dream exclusively along sexual lines. For example, climbing symbolises according to him the sex act, mother and sister are, again, love objects. Adler, of course, would interpret it as indicating the young man's attitude to or style of life. He would also perhaps, regard it as a rehearsal of the young man's mode of meeting the present problems of life. Jung on the other hand, finds an analysis of this dream that the mother suggests neglect of duties, while the sister stands for love for a woman. Moreover, climbing stairs means making a success of life and the expected child symbolises the regenerating or new birth for the young man himself. So according to Jung, dream not only throws light on the dreamer's present problems but also on how he would face future ones.

Jung extended the meaning of symbols in mental disorders as in dreams to cover their 'functional' (as discovered by Silberer) as well as their material significance. Functionally speaking, symbols refer to mental states and tendencies, while materially they refer to material objects or persons. Freud, on the other hand, confines himself to the material meaning of dream symbols alone. Jung's word-association method, in contrast with Freud's free association, has already been explained. As a method of explaining the patient's unconscious complexes or of detecting more recent and temporary emotional disturbances, word-association is of known value. Moreover, Jung's study of psychological types centred

round two general attitude types of introversion and extroversion and has been explained in Personality Chapter (17).

Educational Implications

Again, Jung's concept of "collective unconscious" is a useful concept for the teacher. Jung emphasised that neurosis can be traced back to its exciting cause which consists in the individual's lack of psychic-energy adequate for solving the present problems of life. This again has an educational implication for the teacher.

The concept of introversion and extroversion has thrown much light in educational psychology. This again is a useful concept for students of education.

Word-association method involved by Jung is used as an important tool for studying and measuring personality traits.

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DIAGNOSTIC AND REMEDIAL TECHNIQUES

Diagnosis as an aid to Adjustment

THE recent trend in psychology is the use of diagnosis as an aid to adjustment. Diagnosis of an individual's traits and potentialities is essential to the selection of adequate material for effective adjustment. Diagnostic and remedial techniques are important as the basis of improved techniques of teaching and guidance. The pupil who is physically strong and healthy, who is mentally alert, who is emotionally stable and whose home and school environments are well fitted to his needs and interests is usually a well-adjusted and successful learner. If he lacks anything in his environment or in himself the result may be maladjustment. The deficiencies of adjustment require remedial techniques. Redirection and readjustment are not possible, unless the source of difficulty is discovered. The task of discovering such difficulties, in other words, diagnosis is the function of educational leaders.

The scientific approach to an understanding of the nature of the individual's disordered behaviour requires objective study before any treatment is suggested. Diagnosis reveals the existing disorder. Ideal diagnosis on disordered behaviour must take into account the whole person, keeping in view the interaction between soma and psyche or body and mind. Diagnosis embodies as detailed a study as is possible of all the factors that may facilitate or retard an individual's progress in any form of activity. It includes an analysis of personal factors such as physical constitution, general learning ability, special abilities or disabilities, degree of emotional or social adjustment, work habits and achievements and environmental influences. In simple words, diagnosis combines three things: (i) causal factors of discard; (ii) estimate of the prognosis; (iii) identification of the patient's conditions in terms of one of the accepted clinical entities. In other words diagnosis requires the combined efforts of doctor, psychologist, social worker and psychiatrist. All of them work as a team. This is also called interdisciplinary approach.

Interdisciplinary Approach

In the interdisciplinary approach the patient is studied through individual and family interviews, psychological examinations, laboratory reports, school records and social investigations. In short, a complete picture of the background of disturbances is obtained.

The doctor conducts a physical examination in order to find out the organic factors which may be the cause of the patient's trouble. Examples are injury to the brain or spinal cord, stomach upset, headache and glandular imbalance.

The psychologist conducts interviews with the disordered patient, administers psychological and intelligence tests, and evaluates the existing abilities of the patient.

The psychiatric social worker prepares a life history of the patient which includes economic adjustment, social adjustment and school adjustment of the patient and other related factors.

The psychiatrist studies the mental status of the patient in relation to all other findings. It is the responsibility of the psychiatrist to diagnose the trouble.

Diagnostic Techniques

The techniques implied in diagnosis of behaviour and personality disorders are many. A detailed description is given below:

1. Medical Examination

In this technique a general medical history of the patient is taken. The functioning of the various organs of the body are investigated. A physician wants to study the presence of any physical condition having a bearing on the personality disorder. In diagnosis the physician studies the history of metabolic and endocrine functions, cardiac activity, blood and urine chemistry and gastro-intestinal and genito-urinary functions.

2. Case Study

The case history is usually obtained by a psychiatric social worker from the patient or a close relative. Coville¹ and others have included the following data in case history.

1. Identifying data (name, address, age).
2. Statement of the presenting problem (symptoms, complaints).

1. Coville, W.J., et al., *Abnormal Psychology*, Barnes and Noble, Inc., New York, p. 237.

3. Health history (illness, serious disease, surgical operations).
4. Developmental history (course of growth through infancy, childhood, and maturation).
5. Family history (description of the family constellation, its health history and interpersonal relationships).
6. Educational history (school and college progress).
7. Work history (record of occupations, length of service, general occupational adjustment).
8. Patient's interpersonal relationships (patient's attitude and behaviour toward others in various aspects of his life experience).
9. Psycho-sexual history (sexual habits and attitudes of patient).
10. Marital history (statement of marital status and description of marital adjustment).
11. Special personal habits and interests (talents, skills, hobbies).
12. Personality traits (description of mannerisms, reactions, moods and emotional patterns of the patient).

3. The Psychological Examination²

The psychological examination is conducted by the clinical psychologists. Although he also uses the interview technique, his principal function in the diagnostic team is the administration and interpretation of a battery of psychological tests which may vary in content from one type of diagnostic problem to another. It is the psychologist's responsibility to select the test battery to be employed with the particular patient. He may include tests of intelligence, aptitude, special functions, interests, and personality. The personality tests constitute the significant core of the typical test battery.

Intelligence Tests

In clinical practice intelligence tests are used to gauge the patient's mental ability, to distinguish between his potential and his functioning level, and to aid in the process of differential diagnosis. Group tests of intelligence are used, but rarely in the clinical setting. The principal individual tests are the Wechsler-Bellevue

2. In India tests for psychological examination have been adopted or standardised. For studying the diagnosis of an Indian patient the reader is referred to *Indian Measurement Year Book* published by National Council of Educational Research and Training, except the Herman Rorschach test, which is culture free, and can be applied successfully on Indian patients without introducing significant changes in its administrative and interpretative procedure.

Intelligence Scales and the 1937 revision of the Stanford-Binet Intelligence Scale (recently revised and now available as the 1963 L-M Revision). Where a language handicap exists intelligence is measured by one of the non-verbal performance scales.

Since their publication in 1939, the Wechsler-Bellevue Intelligence Scales Form I and Form II have been the preferred instrument for evaluating the intelligence of patients in the adolescent and adult age range. The scales comprise five verbal sub-tests (information, comprehension, digit-span, arithmetic, and similarities) and five performance sub-tests (picture completion, picture arrangement, object assembly block design, and digit symbol substitution). An additional vocabulary sub-test may be included. A revision designated the Wechsler Adult Intelligence scale (WAIS) was published in 1955 and a scale for children (WISC) in 1949. The Wechsler scales afford much material for qualitative diagnostic evaluation and they give a highly valid quantitative measure of mental capacity.

Tests of Concept Formation, Aptitude and Interest

For some special diagnostic problems, the Goldstein-Scheerer or the Haufmann-Kasnin³ tests may be used. These tests reveal weaknesses in concept formation and abstract thinking and are useful in work with patients in whom brain damage is suspected, as well as with schizophrenics. Other useful tests of special function are the Bender Visual Motor⁴ Gestalt, the Porteus Mazus, and the Lowenfeld Mosaics tests. Tests measuring various aptitudes may be used in cases where vocational adjustment is indicated to be a problem. Tests of interest, such as the Strong Vocational Interest Inventory or the Kuder Preference Record, are similarly useful.

Personality Tests

Without question the major contribution of the clinical psychologist in the diagnostic process is his skill in the administration and interpretation of various personality tests. These may be grouped into projective techniques and personality inventories. Although the latter are occasionally used for clinical work, most psychologists have found the projective techniques more sensitive and of greater diagnostic value.⁵

Prospective Techniques

Under this heading is grouped a large number of methods for the development of insight into the functioning of the personality. These methods have in common the following characteristics:

3. *ibid.*, p. 238.

4. *ibid.*

5. *loc. cit.*

(1) They evaluate the total personality instead of merely providing scores on a series of discrete traits.

(2) The stimulus situations that are used call forth a broad range of individual responses so that a pattern of responses uniquely characteristic of the individual under study will be revealed.

(3) The subject is asked to respond to, interpret, or complete a relatively unstructured stimulus (for example, an ink-blot). In doing so he projects his conscious and unconscious needs, wishes, and fears. These projections provide the raw data for analysis by the clinical psychologist.

(4) The individual's behaviour (beyond his verbal responses) is noted and interpreted under relatively standardised conditions.

The most widely used projective techniques are the Rorschach Examination, the Thematic Apperception Test (TAT), the Draw-a-Person Test, the Make-a-Picture Story Test (MAPS), the Sentence Completion Test, and the Word Association Test.

The Rorschach Examination, devised by the Swiss psychiatrist Herman Rorschach (1884-1922), and published in 1921, is the most widely used projective technique for testing the personality of adults and children. It consists of ten ink-blot presentations to the subject in a standardised sequence for his interpretation and association. His responses are analysed on the basis of his use of form, colour, texture, movement, content, conventionality, originality, and speed of response. Normative data are available in psychological literature, but not the validity of the clinician. While the Rorschach test is an aid in diagnostic classification, its principal value is to shed light on the structure and dynamics of the personality. The test reveals such aspects of the personality as contact with reality, richness of mental life, defence mechanisms, anxiety, depression and other aspects of interpersonal adjustment; The Rorschach Examination also lends itself to a qualitative evaluation of the patient's behaviour in the test situation. As is the case with all psychological tests, it is most valuable when used as a part of a battery of tests.

The Thematic Apperception Test⁶ (TAT), devised by Morgan and Murray in 1935, consists of a series of pictures of somewhat indefinite content. These are presented to the subject with instructions to make up a story for each picture. The stories are then analysed according to the predominant themes, mood, or emotions attributed to the characters in each story. The underlying hypothesis is that by a process of identification, which may be unconscious, the patient projects his own drives and conflicts. This test has greater value for uncovering personality dynamics than it

6. The Indian adaptation of the test is available now.

has for establishing diagnostic classification. The patterns it reveals are more likely to be related to the life experience of the individual than are those uncovered to the Rorschach. The pictures are also used to stimulate association in therapeutic sessions. For use with children, a variation, the Children's Apperception Test (CAT) has been developed.

The technique used in the TAT lends itself to the development of a special series of pictures for particular diagnostic purposes (for example, predication of delinquency, or measurement of prejudice).

The Draw-a-Person Test requires that the patient draw a person as well as he can. Upon completion of the first drawing, he is asked to draw a person of the opposite sex. The analysis takes into consideration such factors as size and placement of figures, relationships between the male and female figures, type of lines, distortions, omissions, measures, and bizarre treatment of various parts of the human figure. The basic assumption is that the drawing represents the patient's body image, and that attitudes, impulses, and conflicts are reflected in his drawing. Problems in psychosexual adjustment are frequently revealed by this technique. The drawings must be interpreted with caution and require a high level of clinical skill. One of the values of this test is its brevity and the ease of administration. A variant of this test is the House-Tree-Person (HTP) drawing test.

The Make-a-Picture Story Test (MAPS) consists of a large number of cut-out figures and various backdrops. The patient is asked to select figures and arrange them before a selected backdrop. He is then asked to tell a story about the arrangement he has made. It is assumed that the patient will select, arrange, and tell stories about the figures in accordance with his own conscious needs and feelings.

The *Sentence Completion Test* consists of a series of incomplete sentences which the subject is asked to complete with his first spontaneous association. The content of the stimulus phrases is arranged to elicit reactions to principal conflict areas. The hypothesis underlying the technique is that in completing the sentences the patient will reveal his own attitudes toward the areas touched upon. Although standard sentence completion forms are available, interpretation is largely dependent on the ingenuity and clinical skill of the examiner.

The *Word Association Test*, probably the oldest of all projective techniques, was originally described by Carl Jung. Since his time psychiatrists and psychologists have used lists of words to elicit spontaneous associations from their patients with a view to uncovering conflict areas. Diagnostic indicators of conflict are said

to be characterised by lengthy reaction time, odd or bizarre associations, stammering, or other signs of tension. Clinicians vary in the way in which they analyse the association processes revealed by the test.

There are other projective techniques. The Szondi Test utilises a series of portraits of psychiatric patients, which the subject is asked to arrange according to preference. His choice is said to reveal material of diagnostic value. *The Rosenszweig Picture Frustration Test* utilises a series of action pictures which the patient is required to identify with one of the figures and express his verbalization of the described frustrating situation. The Rosenszweig test provides normative data on the basis of which various ways of handling aggression may be determined.

Handwriting analysis is another projective method in which detailed, painstaking study is made of the patient's handwriting on the assumption that it is an expression of personality.

Play techniques, although principally used as a therapeutic vehicle for children, may also be used in the diagnostic process. Dolls, puppets, and playhouses are utilised to elicit emotional attitudes and conflicts.

Art analysis utilizes finger painting or more formal means of art expression to reveal patterns of emotional reaction in both adults and children.

Personality Inventories: In these objective standardized tests, the patient is required to answer specific questions about his own behaviour or attitudes. The patient's responses are usually restricted to indicating whether or not a given statement is pertinent. Some of the tests are relatively simple, calling for only a Yes or No response; others require comparisons and selections among several items. Generally speaking, personality inventories have a limited application in clinical practice: they are used mainly with groups, for purposes of preliminary screenings.

Although there are numerous published inventories, the Minnesota Multiphasic Personality Inventory (MMPI) is the referred test of this type. It consists of 550 items which have been gathered from the case records of patients having various psychiatric disorders. The degree to which the subject's answers correspond to items normally found in particular types of psychiatric history suggests his tendencies in that direction. Scores are expressed in psychiatric terms and provide measures of tendencies toward the following types of disorders: hypochondriasis, depression, hysteria, psychopathic deviation, paranoia, psychasthenia, schizophrenia, and hypomania. The test also purports to measure masculinity, femininity, and sociability. Extensive research has been done with this

test, and it stands along the inventories with respect to its usefulness in clinical practice.

The Psychiatric Examination

The psychiatric examination utilises an interview with the patient to observe and evaluate significant aspects of his behaviour. Exaggerations, distortions, and the absence of expected responses or the presence of abnormal responses are recorded. The traditional psychiatric examination includes statements on the following:

Appearance and General Behaviour. This statement usually describes general health and appearance, habits of dress, personal habits, speech, moods and sociability.

Attitude and Behaviour during the Interview. This statement describes the patient's attitude toward the interviewer (expressive movements as revealed by manner, voice, posture, facial expressions and motor activity).

Stream of Mental Activity. The data recorded here concern verbal productivity, spontaneity of stream of thought, distracting language deviations and reaction time.

Emotional Reactions. These are related to the patient's general activity, his mental trend or thought content. Generally, the emotional reactions observed by the interviewer and what the patient says about his feelings are recorded. Thus, the interviewer may note whether the emotional reactions are appropriate or not, whether the patient is composed, suspicious, depressed, indifferent, angry, elated etc.

Mental Trends. The statement with regard to mental trends or thought content describes persecutory trends, hypochondriacal ideas, ideas of unreality, nihilistic ideas, depressive trends, and grandiose ideas or hallucinatory experiences.

Sensorium, Mental Grasp, and Capacity. This statement estimates the patient's intellectual capacities and resources. The estimate is based on the patient's responses to questions that measure his orientation as to time, place, and person, his memory for the remote and recent past, his powers of retention and immediate recall, his abilities in counting, calculation and writing, and his school and general-knowledge.

Summary of Psychiatric Examination. The main findings are summarised and a statement is made concerning the patient's intellectual capacities, evenness of performance, deteriorative trends, and self-evaluation.

6. Diagnosis of Pupil Difficulty

Unless careful diagnosis is done, the underlying causes of mal-adjusted behaviour can be misinterpreted. Every pupil is entitled

to receive careful study from his teachers and other school leaders. Young pupil's attitude and behaviour needs to be evaluated. Individual or group difficulties should be recognised and their causes discovered. Remedial techniques should be established and steps taken to prevent the occurrence or reoccurrence of such difficulties. Since the human personality is extremely complex any attempt at the discovery of basic causes of maladjustment is a difficult and painstaking process. Hildreth⁷ suggests that the following five areas of investigation are important.

(a) *Mental Equipment of the Learner*

This includes aptitude for academic school work, learning capacity, readiness for learning habitual modes of response, judgment, reasoning ability, insight memory, association, perception, attention, span, ability to see relationships, creative ability, intellectual interest and habits, command of mother-tongue, vocabulary, and matter composition.

(b) *Personality, Temperament and Dynamic Equipment*

This includes the following:

Self control, affability, desirable and undesirable inhibitions, attitudes, drive stability, responsiveness, shyness, day-dreaming, fear, sex interest, manners, attitude towards failure, school disability, play interest, worries, ability to get along with other children, delinquent and anti-social activity, and degree of normal adjustment.

(c) *Physical Status*

This includes the following:

Physical status, sensory and motor equipment, physical conditions, sensory activity, constitutional defects, physical maturation, disease history, glandular balance, condition of teeth, etiology of illness, posture accidents, psychomotor status, muscular strength or weakness, handedness, steadiness and coordination.

(d) *Environment and Home History*

This includes the following:

Economic factors, literacy of parents, number of siblings, marital status of parents, evidence of culture, harmony in home adjustment, attitude of home towards school, neighbourhood environment, association with other children, and full time activities of the child.

7. Hildreth, C., *Learning the Three R's*, Minneapolis, Educational Publishers, 1939, Ch. 8.

(e) *Child's Daily Schedule*

This includes the following:

Child's daily schedule, nursing, eating, sleeping, play, school work at home, and regularity or irregularity in home programme.

(f) *School Situation, History and Present Status*

This includes the following:

Method of instruction, size, capability of class groups, school work, school progress, etc.

The function of diagnosis or evaluation is limited to the prevention of possible academic difficulties and to the guidance of the pupil into desirable present and future activities.

7. Method of Pupil Evaluation

The following are the diagnostic techniques for pupil evaluation:

1. Trained observation.
2. Physical examination.
3. Classroom and school tests and examinations.
4. Standardized tests, scales and inventories including intelligence tests, aptitude tests, achievement tests, interest inventories, personality, scales and inventories.
5. Case study techniques (This has already been discussed in the preceding pages).
6. Interview.

Each of these techniques is limited in its usefulness since the total personality is something more than the sum of its factors. No one technique can measure adequately the inter-relation of the various phases of individuality. Moreover, the personality of the tester or evaluator may affect the results of the diagnosis. For example, personal prejudices, degree of facility in handling, measuring techniques or the adequacy of testing conditions and of the tests may seriously affect the actual measuring process and the interpretation of the results. All the results of the measurement need to be recorded accurately and the recommendations followed carefully if diagnostic procedures are to be made effective.

Observation as a Diagnostic Technique

Pupil maladjustment may be brought to the attention of the teacher as a result of observation of behaviour. The child who has

difficulty in sitting in a correct posture, who cannot read material on the blackboard, who holds his book close to his eyes, who stammers or shows other signs of distress when called upon to recite, or who is generally uncooperative, displays to the observant teacher the presence of characteristics that need attention.

The value of observation as a tool of diagnosis depends upon the ability of the observer to make accurate and objective observations. The observer must be an emotionally well-balanced person, his training and experience should be such that he is able to recognise the presence and possible causes of deviations from normal behaviour. He should be alert and objective in his comparisons of normal behaviour with abnormal reactions.

Diagnostic Techniques for Difficult Pupils

Physical Examination: Physical health is the foundation of mental health. The school should prevent undesirable health activities, and physical examination should be made available as far as possible. A record of all physical examinations should be kept.

Classroom and School Tests and Examinations

This includes the following:

Daily, weekly, monthly, mid-term and end of the term tests. These are generally accepted as essential to teaching and learning.

Short-term test questions such as true-false, completion, multiple-choice and matching of carefully constructive and based upon worthwhile material give opportunity for a comprehensive diagnosis of the specific difficulties associated with any learning situation.

Standardized Evaluatory Techniques

For the comparison of the behaviour of any one individual or group of individuals with more trustworthy norms of performance, it is desirable to administer measuring techniques that have been standardized carefully through application and large number of subjects, under controlled testing conditions.⁸

Measurement of Intelligence

Mental competence is an essential factor of mental health. It is the duty of school leaders to obtain as accurate a knowledge as is possible of the mental ability of their students and then to adjust the learning process and teaching technique to the respective levels

8. For Indian Tests the reader is referred to *Indian Measurement Year Book* published by NCERT.

of ability. The importance of mental tests has already been discussed in the Chapter on *Intelligence*.

Measurement of Specific Aptitudes

Aptitude is a present condition which is indicative of an individual's potentialities for the future. Individual tests are designed to measure the degree of general alertness without emphasis upon any specific form of ability. An individual may be slow in general but may be better in one particular form of response. In order to determine the kind or extent of an individual's potentiality for success apart from training in one field, a specific form of measurement known as aptitude test must be administered. Since occupational competition is keen, young people should be assisted in discovering their vocational field.

Measurement of Achievement

The techniques which have been discussed so far test inherent ability apart from directed and conscious training. Achievement tests differ from these in that all achievement tests have for their purpose the measurement of results of teaching and learning. An achievement test presupposes instruction in the definite field for which the tests have been constructed. Such tests may be either survey tests for the measurement of the outcome of teaching techniques or diagnostic measures of pupil difficulties.

Utilisation of the Case Study

For areas of pupil difficulty, the case study can be done by the following:

1. Physical, mental, and personality evaluatory techniques.
2. Record of school progress.
3. Health norms and charts.
4. Interview with the subject, his family members, parents, etc. Case histories of pupils include:
 - (a) Identification.
 - (b) Family background.
 - (c) Health history.
 - (d) Home and neighbourhood environment.
 - (e) Social and economic status.
 - (f) Intelligence.
 - (g) Social progress.
 - (h) Work history.
 - (i) Social behaviour and interests.

- (j) Sex deviation.
- (k) Interpretation of data.
- (l) Recommendation.
- (m) Progress.

Interview as a Technique of Diagnosis

Problems arise in the lives of most individuals that demand intimate personal constitution with other persons who are qualified to assist in the solution of the difficulties. The attitude should be sympathetic, tactful understanding and objective. Rambling should be discouraged. Frankness should prevail.

The Teacher's Role in Pupil Diagnosis

Remedial teaching is impossible without a knowledge of the factors that influence human behaviour. The teacher should become acquainted with the previous diagnosis. The teacher should use informal techniques of evaluation which include classroom behaviour, oral recitation and written test responses. These usually give an indication about the emotional disorder of pupils. The teacher should also use standardized measuring techniques.

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THERAPIES: THEIR NATURE AND TYPES

Psychotherapy

PSYCHOTHERAPY is the most important and adequate form of health cure available for psychologically distressed individuals. This is a method of treatment which aims at helping distressed individuals by influencing and stimulating their emotional process, their evaluation of themselves and others and their method and manner of coping with the problems of life. Therapies influence and change the patient's environment and increase his potentialities of mastery and integration. Therapies are required for disturbances which are emotional in origin and which contain a large emotional factor.

Therapies represent a fusion of the immediate needs of the patient and the demands of society. Therapies have two aims: (i) clinical aims, and (ii) dynamic aims.

1. Clinical Aims

- (a) Relieving symptoms (suffering).
- (b) Increasing the ability to be happy.
- (c) Increasing efficiency.
- (d) Aiding in social adaptation.
- (e) Increasing spontaneity.
- (f) Adjusting bodily functions i.e., eating and sleeping.

2. Dynamic Aims

- (a) Increase in the patient's feelings of self-esteem and security.
- (b) Release of forbidden and repressed impulses.
- (c) Increase of insight in patient.
- (d) To increase self-acceptance i.e., the patient accepts himself as an individual.

- (e) To increase integration and reaching towards positive goals.

In psychotherapy the relationship between the patient and the therapist is of utmost importance. The psychotherapist must have a good personality and better training. He must establish good rapport with the patient. Good rapport means a frank attitude on the part of the patient, which enables him to pour out his difficulties to the therapist. It implies a hope of being helped and an eagerness to cooperate for that end. In other words, therapy requires good relationship between the patient and the therapist. The attitude of the therapist must be that of a person who listens to everything without criticising, condemning or censoring. The attitude assures the patient that he can say what he wishes. The patient thinks that the therapist is the only person to whom all secrets may be told. The patient also regards the therapist as stronger and superior in comparison. This way all the irrational attitudes, suspicions, hostilities, and excessive demands which the patient has towards the world will unconsciously be focused upon the therapist.

Techniques of Psychotherapy

A variety of techniques have been developed in treating a patient psychologically. They are as follows:

1. Therapeutic Interviews

An interview is any type of prolonged contact between the therapist and the patient in which conversation plays a prominent role and which centres round the patient's problems. The set-up is such that it encourages the patient to unburden himself and talk about his complaints and the stress and strain of his existence. Some patients do this almost spontaneously, whereas, others require a measure of guidance from the therapist. The aim of the therapist is to touch, sooner or later, on all significant aspects of his life. He may guide the patient's conversation to further topics by repeating in the form of questions, something which the patient has already touched on, or by raising new queries. In this procedure it is very important to observe the patient because he shows by facial expressions, changes in colour, and halting and evasion, where the points of stress lie. Such signs of them as are mild, guide the therapist in recognising what points should be taken up; if they become severe, what points should be left alone for the time being.

To know in what direction to guide or not to guide the conversation, the therapist must have a thorough knowledge of psychotherapy. It is obvious that in the interview the patient does most of the talking and that the interview is a diagnostic as well as a therapeutic procedure. The close interrelation between diagnosis and therapy is a characteristic and unique aspect of psychotherapy.

Interviews of this type usually last about an hour and occur once or twice a week. If there is a great need for help, they may be given daily for a period of time. If they are effective in patients who do not require institutional treatment, beneficial results may be apparent after one interview. If improvement is not evident up to ten sessions, it is futile to continue. The total number of interviews needed depends upon the patient.

Why and how is the patient benefited by therapeutic interviews? The pertinent question has been raised by many psychologists. The answer lies in the fact that the patient talks to an individual whom he thinks strong and capable of giving help, who listens to everything and who encourages him to speak without condemning or punishing him and this allays his fears and guilt and makes him feel more worthwhile and accepted. Together with this, there is an implicit development in spontaneity and frankness through the very fact of talking about forbidden and avoided subjects. He gradually feels that he has faced himself and his problems. The burst of emotions frequently occurring in interviews leads to release. The therapist is a trusted and sympathetic friend.

Interview therapy may be particularly effective in relieving the acute symptoms of any psycho-neurotic disturbance of relatively recent origin. It can be very effective in patients who have mild disturbances of a psychotic type, but can still function in society. In addition to organic treatment, it can be of further benefit to patients with psychological disturbances complicating an organic ailment. If necessary, for organic diseases the therapist must advise physical examination and laboratory tests.

2. Psychoanalysis

The therapy of psychoanalysis was developed by Sigmund Freud. He developed this therapy in the course of his private practice as a physician over a period of years. The essential methods of this psychoanalysis therapy according to Coville¹ are (1) systematic utilisation of free association, (2) dream analysis, (3) the transference neurosis, and (4) interpretation and re-education, which the goal of resolving the principal emotional problems of childhood. By these methods, the patient's repressed unconscious material is brought to the level of awareness, is explored, and is interpreted in relation to his symptoms, his concept of self (ego) and his relationship with others.

Free Association. This follows preliminary interview during which a case history is obtained and a working diagnosis is established. The patient is encouraged to relax by reclining on a couch, with the therapist in the background. He is then instructed to report

1. Coville and others, *Abnormal Psychology*, Barnes & Noble, Inc., New York, 1963, pp. 245-49.

to the therapist anything and everything that comes to his mind without censorship of any sort. In the early psychoanalytic sessions, the patient may experience great difficulty in achieving the free association: one or more sessions may pass in which he produces nothing which is suitable for the therapist's analysis and interpretation. As the therapeutic relation proceeds, however, the ability to associate freely is developed and this enables the patient to express ideas and feelings which have been repressed, some for a period of many years. The rapidity with which this ability is related to the degree of resistance to therapy displayed by the patient. Nor does free association always proceed evenly or in chronological sequence; it may be interrupted by blocking, withholding of associations, and purposive production of irrelevant and distracting material.

The associations, as ultimately produced by the patient and recorded by the analyst, gradually form a mosaic of ideas and feelings which, while they seem to be incoherent, illogical and faulty in time sequence, are nevertheless emotionally related. Equipped with his knowledge of the patient's life history and his observation of the patient throughout the therapeutic experience, the analyst recognises the dynamic meaning of these associations and from time to time guides the patient toward particularly meaningful areas of thought and feeling. The chief virtue of this method is its 'ventilating' effect, referred to as 'catharsis'.²

Dream Analysis. Dream analysis is often a fruitful method of psychotherapy. Following the lead of Joseph Breuer (1842-1925), Freud perceived that in the dreams reported by his patients lay clues to significant unconscious material. The method has since persisted as a standard practice among psychoanalysts. During a therapeutic session the analyst asks the patient to report his dreams. The difficulty of recalling the details of a dream is well known, but a patient who has been under analysis for some time and has gained the ability to free-associate readily, will also have developed a facility to recall the dreams. The content thus revealed by the patient, along with the substance of the underlying problems which the dream suggests, are then employed by the therapist as stimuli for further associations. Dream analysis may be conceived as a form of free association, but in the Freudian concept the dream is so highly organised a form of mental activity that it merits special listing.³

According to Freud, dreams have both a manifest and a latent content. The dream images and their apparent meanings are the manifest content; the unconscious, conflictive material, for which the dream images are symbolic substitutes, is the latent content. Both levels have importance in the treatment process. The manifest

2. *loc. cit.*

3. *loc. cit.*

content of dreams is often determined by immediate environmental circumstances and recent or remote life events. The symbols chosen to express the unconscious (latent) meaning of the dream may be universal or accidental. Universal symbols are those which have a generally accepted meaning for a given cultural group (such as phallic symbols); accidental symbols are those having a special meaning in terms of the life experiences of the individual relating the dream.

Two mental mechanisms characterise the manner in which a person works out a conflict or some other problem in his dream. Through condensation a single composite image of the manifest content may stand for a number of ideas or feelings. In the mechanism of displacement, effect which is in reality associated with one respect of the dream is expressed in relationship to another aspect. These two mechanisms bring about a distortion of the dream content believed by Freud⁴ to be an unconscious device to disguise unacceptable thoughts and feelings and thus protect the ego against a sense of guilt.

The modes of dream interpretation and their application in psychotherapy differ among analytic therapists, depending on the school of analysis in which they are grounded, but the fundamentals are by and large the same.

Transference Neurosis: A transference neurosis exists when the patient transfers to the therapist the emotions which have been repressed since early childhood. In the treatment experience, such transferred emotions usually emerge as mild manifestations directed towards the analyst. As the therapeutic procedure continues these emotions grow in intensity and duration. In the eyes of the patient, the therapist assumes the role of a stern parent (or other person who stood in this relation to the patient in childhood). This is an extremely valuable instrument for the therapist in his probing of the patient's subconscious because it encourages the patient to re-live the emotional experiences of his early years. Referred to as abreaction, the patient's response to this mechanism is the most critical phase of the psychoanalysis.⁵

The transference neurosis may lead to attachment, to dependency on, and even love for the therapist (positive transference); or it may give rise to resentment, impatience, and often violent antagonism toward the therapist (negative transference). The latter reaction brings about a severe, though usually temporary, disruption of the therapeutic process. The anxieties aroused by transference neurosis are among the unpleasant features of psychoanalytic therapy, and if they are not successfully resolved they may be harmful to the patient, in view of their 'out of the frying pan into the fire'

4. op. cit., p. 247.

5. op. cit., p. 248.

effect. It should be noted that a counter-transference from a therapist to patient may develop. To guard against this the therapist must in his own attitudes remain as aloof as possible and must avoid being thrown into the morass of the patient's turmoil.

Interpretation: Interpretation is essential throughout the course of a psychoanalysis; the therapist must be continually alert to opportunities to decipher and interpret the dynamic meaning of free associations, dreams, and the behaviour of the patient. He pays particular attention to any feelings that are expressed by the patient and seeks to ferret out the relationship between these feelings and the nature of the material being discussed.

The interpretations offered by the analyst fall into two categories: those which call the patient's attention to the emotions he is expressing (the dynamic significance of which are then explained); and those which help the patient to recognise the defence he employs to keep threatening or unpleasant feelings repressed.

The analyst must have a keen sense of timing.⁶ He must be extremely careful to pick an opportune and appropriate time to share his interpretations, called the "working through". This constitutes an essential phase of psychoanalytic therapy. The unveiling of an interpretation at a point when the patient is unprepared to accept it and profit by it can be valueless or even dangerous.

Because interpretation is so critical a matter, the analyst must be completely aware of his own defence mechanism and drives; otherwise he will fall into the trap of interpreting the patient's dynamic feelings and thoughts in terms of his own life experience and underlying problems. This is one of the reasons why psychoanalysts are required to undergo a personal analysis.

3. Play Therapy

Play therapy is usually meant for children who find it difficult or impossible to speak out their conflicts. In play therapy children are encouraged to engage in free play in which conflict can be more adequately expressed.

The essential methods of play therapy are offered by way of dolls, puppets, miniature household furniture, clay, sand, water and other toys. Through the manipulation of these toys, the child reveals unconsciously his feelings of frustration and hostility.

The play with dolls is very helpful in understanding the dynamic relationships in the family as the child experiences them. Play therapy allows the child to express unconscious aggression. It also provides release of tension in the patients and is used in diagnosing the patient's trouble.

6. op. cit., p. 249.

4. Group Therapy

Group therapy 'means that psycho-therapeutic procedure in which several individuals are simultaneously undergoing therapy. The size of the group may vary from 3 to 50. In practice, group therapy has as many variations as individual therapy. Earliest form of group therapy were largely didactic with the group leader lecturing, persuading and directing. With the new development in the field the group leader has come to serve the same function for the group as does the individual therapist for the patient. He encourages expression, examines motives, offers interpretation and gradually elicits participation of the individual member. According to Coville⁷ the essential features of group therapy are as follows:

1. The group is selectively screened to achieve some degree of homogeneity and congeniality. The factors considered are age range, sex distribution, diagnosis, general personality characteristics and prognosis. The controlling consideration and the weight given to any of these factors in selecting patients depends upon the therapist. Groups are usually small, the optimum number ranging from six to ten. Most groups meet once or twice a week for several months or longer.
2. Varying practices exist in the use of group therapy in relation to individual therapy. Thus, some therapists will select and prepare a patient for group therapy only after a course of individual therapy; others will maintain the patient in individual and group therapies concurrently; some will enter the patient directly into the group setting without individual therapy.
3. The therapist attempts to create a permissive atmosphere which encourages spontaneity of expression. In the beginning, patients relate their own symptoms and problems. Gradually, they embark upon discussions of significant emotional experiences in their outside life and eventually, they evaluate and comment upon the experiences of their members.
4. In the group situation, conformation to a rigid pattern of participation is not required. Thus, patients can participate in their own manner, at their own pace, and with varying degrees of resistance.

The following example gives us an idea about group therapy. This example also shows that in small groups any personal problem, impulse, attitude, conflict, guilt, hostility or anxiety is discussed on the basis of personal experience.

7. op. cit., p. 254.

Example

- 1st Patient : As a little girl, I used to wet the bed. I used to hate to go to bed, fearing, may be, I would have an accident.
- Therapist : Those were possible feelings.
- 1st Patient : What happens when even adults dream they are going to the lavatory and wet the bed?
- Therapist : That is miserable too.
- 2nd Patient : My mother told me I was heartbroken in a year.
- 3rd Patient : I remember when I was about 12 years old a girl friend pulled her pants down in the back of the garage and did her business. I thought it was awful.
- 4th Patient : When I was about ten, some of the boys would pull down their pants and the other boys would do acts with them. I think there is something in that that makes me shy with other men. I never connected it until this minute—a kind of fear of other men because of that.

At this point another patient volunteered:

I remember when I was a child, one day my dad came in and I wanted him to show me a picture. He showed me one of me sitting on the toilet and after that I never cared to have any one draw pictures any more.

Group therapy breaks down the patient's feelings of isolation and uniqueness of his illness. He comes to know that there are other individuals who also suffer from the same tension. This helps him in releasing the tension. Another advantage of group therapy is that it offers opportunities for social experience in which the patients may test their own growth in inter-social relations and the therapist may observe the patient's work.

5. Psycho-Drama

The technique of psycho-drama was developed by J.L. Moreno. In psycho-drama the patient is encouraged to act out before an audience. In psycho-drama the patient is asked and instructed to act out an emotional constellation as if he were an actor on a stage. This therapy has also been used to prepare individuals for future situations. It has also been used in industry for training in handling inter-personal problems. The therapist acts as the director on the stage. He obtains information through an interview about the patient's symptoms and problems of life situations.

6. Insulin Shock Treatment

This is also known as insulin shock therapy. This was developed by M.J. Sakel. Insulin shock treatment is based upon the fact that when an individual is given a large dose of insulin, the amount of sugar in the bloodstream is rapidly diminished to a point where the patient goes into shock and becomes unconscious. As a result of this shock, the brain is deprived of sugar, its most important food, and the body is excessively stimulated to utilise all of its forces. When this occurs the normal pathways in the brain are somehow reinforced, and gradually the behaviour of a mentally sick individual subject to such treatment is restored to normal.

A patient with the type of illness known as manic-depressive psychosis—which is manifested by underactivity, loss of emotional control, swings of mood from extreme depression to extreme excitement—can often be speeded to recovery by the use of mental treatment. Involutional melancholia is another form of mental illness which is being treated successfully by the use of insulin. This mental illness occurs during the change of life period in both men and women and is characterised by depression of mood, severe anxiety, and delusions that the body is being destroyed in strange and impossible ways.

7. Music Therapy

The use of music as a therapeutic measure in emotional and mental disorders began hundreds of years ago. The chief significance of music as a means of therapy lies in mechanism of the human brain and the way musical sounds reach and affect it. Music, according to Altshuler, is first perceived by the thalamus. The stimulation of thalamus automatically incites the cortex, which results in gaining the attention of the individual and this makes further therapy possible.

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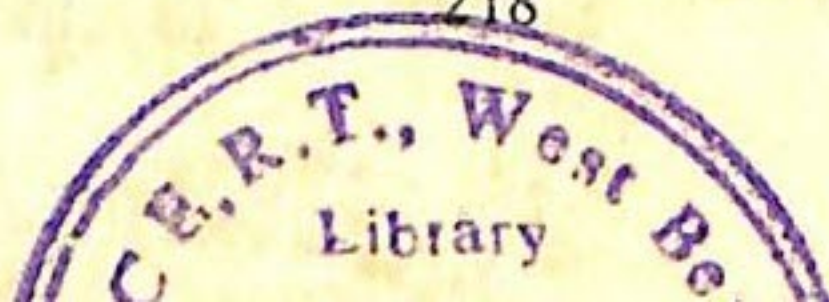
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Of allied interest

COMPUTERS FOR BEGINNERS

—*R. Thiagarajan*

This book is an attempt at explaining the various facets of electronic computers in simple terms. Problem solving has been given more prominence in preference to hardware. Some of the common languages Basic, Cobol, Fortran PL/I, APL, are mentioned and the basics of how a computer programme is compiled. With the plans of the Government of India to introduce computers in schools, it is hoped, the book would become a 'Computer Primer' textbook. With this in view a number of questions have also been provided at the end of every chapter.

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INTRODUCTION TO EDUCATIONAL TECHNOLOGY

—*K. Sampath, A Pannirselvam & S. Santhanam*

The complexity of the teaching learning process coupled with the increase in number and diversity of school-goers as well as the ever expanding horizons of modern knowledge have highlighted the need for proper planning of instructional strategies and optimum use of instructional resources by the teachers of today. The new field of Educational Technology is concerned with meeting this need. This introductory volume written by three highly experienced professors covers the psychological, technological and educational aspects of this new field and presents in a clear and analytical manner the basic ideas and concepts of educational technology.

Mr Sampath is a consultant in this field to colleges and industrial organisations.

Prof. A. Pannirselvam has been teaching in training colleges for the past twenty years. He is currently engaged in research work for his doctoral degree in the field of adult and continuing education. He has been the author of a number of books.

Prof. S. Santhanam does translation and other important assignments for the UNESCO.

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